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# Worldwide Report

ENVIRONMENTAL QUALITY

No. 273

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24 October 1980

WORLDWIDE REPORT  
ENVIRONMENTAL QUALITY

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WORLDWIDE AFFAIRS

BRIEFS

BALTIC ENVIRONMENT PACT--The pact for the protecting of the maritime environment in the Baltic Sea area, or the so-called Helsinki Pact, will go into effect on 3 May, as agreed by the signatories. All of the countries bordering the Baltic Sea, namely, Finland, Sweden, Denmark, the Soviet Union, Poland, the German Democratic Republic, and the German Federal Republic have formally adopted the pact. The last to do so was the German Federal Republic on 3 March. The pact goes into effect two months after ratification by all of the Baltic countries. The intention is for the Baltic Sea Protection Commission to hold its first meeting during 5-8 May in Helsinki. At that time a secretary general will be appointed for the Commission and an international secretariat, which will operate in Helsinki, will be established. [Text] [Helsinki HELSINGIN SANOMAT in Finnish 12 Apr 80 p 16] 5955

CSO: 5000

## TWENTY-FOUR RIVERS DECLARED POLLUTION FREE

Kuala Lumpur NEW STRAITS TIMES in English 15 Sep 80 p 14

[Text]

### KUALA LUMPUR, Sun

— Twenty-four of the 44 main rivers in Peninsular Malaysia threatened by pollution four years ago have now been declared free from chronic rubber and palm oil effluents.

Latest studies showed the 24 were now "clean", said the Director-General of Environment in the Science, Technology and Environment Ministry, Mr S. T. Sundram today.

Of the remainder, the condition of five had improved while 13 remained unchanged.

However, the condition of two others — Sungai Melaka and Sungai Rompin — had deteriorated.

Mr Sundram said measures were being taken by the Ministry to arrest pollution in both these rivers.

All the other rivers will be made free from rubber, palm oil and industrial pollution in about two years, he added.

He attributed the improvements in some rivers to the strict enforcement of the palm oil and rubber effluent regulations.

Mr Sundram said the

effect of control of other industrial sources of pollution will become evident only after January 1981 when the sewage and industrial regulations take full effect.

Stressing that river pollution was under control, he said it was not true they were becoming more polluted. — Bernama

CSO: 5000

PEOPLE'S REPUBLIC OF CHINA

BEIJING PLA LOGISTICS ADVISER DISCUSSES POLLUTION PROBLEMS

HK091114 Beijing City Service in Mandarin 2300 GMT 25 Sep 80

[Text] Our station reporter recently interviewed Comrade (Li Manyun), adviser of Beijing PLA general logistics department who attended the third session of the Fifth CPPCC National Committee. While talking to the reporter on pollution problems in Beijing, Comrade (Li Manyun) pointed out: Despite the great efforts and achievements made to control atmospheric pollution in Beijing since 1973, much still has to be done to solve this problem at its roots. In some places, this problem is deteriorating rather than improving. Comrade (Li Manyun) said: Before 0900 every winter morning, Beijing is full of smoke. The average amount of dust and particle suspension in urban areas is 3 to 7 times that of previous years while the concentration of sulphur dioxide is 3 to 4 times that of the past. Atmospheric pollution is very serious. He hoped that Beijing Municipality would work out a practicable plan to control pollution on the basis of past work. For example, the municipality should subject newly built boiler rooms to strict controls and actively and prudently exploit and use electric heat. It should set up a network of heating pipes in the neighborhood of the Beijing powerplant, the coking plant and the No 2 heat and powerplant. It should also set up a steam plant, a system to supply methane and central heating systems. Moreover, suburban production brigades and communes can also produce methane. He pointed out: In order to control atmospheric pollution, it is imperative that some effective measures be adopted to protect water resources. He continued: South of (Wanshou) Road lies the Lianhua River where small fish used to swim in the early 1960's. However, due to the poisonous water discharged by the factories and units nearby, the Lianhua River has become a stinking ditch devoid of life. In Beijing Garrison District Hospital, there is a stretch of water dozens of mu in area. The environment there used to be very good. However, since the establishment of a paper mill nearby which discharges a large amount of waste material, the water there has become dark and stagnant. The water in the Jingmi Aqueduct has also changed greatly. Comrade (Li Manyun) suggested that the municipal committee make a determined effort to move the factories which consume a large amount of water and cause serious pollution to the lower reaches of the water sources in a planned way. He also suggested that waste water processing stations be built in the lower reaches.

CSO: 5000

PEOPLE'S REPUBLIC OF CHINA

POLLUTION OF WUHAN'S DONGHU SAID AT CRITICAL STAGE

Beijing GUANGMING RIBAO in Chinese 9 Jul 80 p 2

[Article by Li Xinghuai [2621 2502 2037], member of the Environmental Protection Bureau of Wuhan City]

[Text] Comrade Editor:

Donghu is located in the southeastern suburb of Wuchang. Its area is 35 square km, and its total capacity is approximately 100 million cubic meters. It is one of China's scenic resources as well as the main water supply for residents of south Wuhan. To develop Donghu into an attractive scenic spot and to protect the water resources of Donghu is essential to tourism, to public welfare, and to the four modernizations program.

However, due to the lack of training in environmental sciences, a few comrades have caused the water quality and natural scenery at Donghu to become polluted and damaged. According to a survey, there are tens of factories along the lake that dump more than 100,000 tons of harmful wastewater daily into the Donghu water system. Tests show that the lake water contains phenol, mercury, cyanogen, cadmium, and other harmful substances. In particular, a number of fisheries around the lake use human waste to feed the fish, resulting in increased level of ammonia and nitrogen content in the water; the water has turned into a greenish color and emits a foul odor. At the present time, water pollution has become a severe problem for the water treatment plant. If no action is taken now and the deterioration continues, the Donghu water supply and its scenery will be totally destroyed; the lake water will no longer be drinkable.

Therefore, we have reached a critical time that immediate and serious measures must be taken to eliminate water pollution and to protect the water supply and scenery of Donghu. It is my hope that the leaders of Wuhan city will do their best in this important effort.

3012  
CSO: 5000

PEOPLE'S REPUBLIC OF CHINA

SHANGHAI ENVIRONMENTALIST, CITY BUREAUCRACY DRAW BATTLE LINES

Shanghai WEN HUI BAO in Chinese 2 Jul 80 p 1

[Article: "Assistant Chief Engineer of Shanghai's Environmental Protection Institute Holds Position in Name Only; When Will the Ambition of Xu Jingwen, an Export on Treatment of 'Three Wastes,' Be Rewarded?"]

[Excerpt] While the pollution of the Huangpu River is getting worse and worse each day, an expert on treatment of the "three wastes" cannot find a place to apply his expertise. While the department in charge of environmental protection feels the urgency as if on fire, the Environmental Protection Institute treats it as if it is a matter of no consequence. How can such a contradictory phenomenon occur? How can we allow such a contradictory phenomenon to exist today?

As midsummer arrived, the foul odor of the Huangpu River and the Suzhou River is getting worse and worse day after day. Now that environmental protection work needs to be strengthened, the assistant chief engineer of Shanghai's Environmental Protection Institute, Xu Jingwen [6079 2529 2429], holds the position in name only. His attempt to carry out scientific research activities has met numerous difficulties and much resistance.

Xu Jingwen was educated in Japan in his early years. For a long period of time after new China was founded, he engaged in research and manufacture of exchange resins and membranes. More recently, he has compiled and published a set of technical data, after having carefully studied advanced techniques related to the treatment of the "three wastes" developed abroad and combining them with the actual situation in this country. He has participated in the design and construction of "closed circuit" wastewater treatment systems for Shanghai's Guangming Plating Plant and Silicon Steel Plate Plant. He is experienced in the field of wastewater treatment.

Xu Jingwen prepared and submitted a proposal concerning treatment of wastewater for the city of Shanghai, based on his experience accumulated over the years as well as his experience at adapting advanced foreign technology to the actual local conditions. First step: Various industrial systems should adopt a treatment technology, including coagulation and filtration, adsorption exchange, membrane separation, and magnetic separation, in order to meet the allowable discharge standard for major industrial wastewater. Then, industries should move gradually toward adoption of a "closed circuit" operation in which the wastewater is recycled and used repeatedly after being treated. Second step: Solve the problems related to organic wastewater by means of biochemical treatment. Xu Jingwen believes that it is possible, taking into consideration the situations in Shanghai, to improve the conditions and solve the pollution problems and save the Huangpu River and the Suzhou River only if all sides combine forces and organize their technical capabilities, building a "closed circuit" experimental system first at those plants where the pollution problem is most serious--including plants such as plating, printing and dyeing, papermills, metallurgy, and chemical processing. The project will be expanded gradually to cover the entire city under the guidance of the Environmental Protection Department, solving Shanghai's industrial wastewater problem step by step via dispersed treatment.

For a very long time, however, Xu Jingwen has had neither power nor responsibility at the Environmental Protection Institute. Not a single concrete plan for the implementation of his proposal has ever been drawn up. Last year he was put in charge of a laboratory without the necessary conditions to carry out his work. When Xu voiced an objection to this arrangement, he was ignored completely. For over a year, Xu Jingwen did not possess the most basic facilities to carry out his work. He had even less power to question his research objectives and job responsibilities at the institute. Although he held the title of assistant chief engineer, he was powerless to use any technical personnel. The institute even disapproved of his participation in a technical authentication meeting as an invited guest. There was almost no room for his desk at the institute; he just occupied a corner in the planning division. The leading member of Shanghai's Bureau of Environmental Protection tried to find a solution to this matter without success. Having no work to do at the institute, Xu Jingwen, with the blessing of the leadership of the bureau, has gone out to help other units solve their wastewater treatment problems. Since he has helped solve so many problems for so many people outside the institute for so many years, there are many people who seek his assistance. Besides his job at the institute, he holds the titles of vice chairman of the board of directors of Shanghai's Clean Water Society, assistant secretary of Shanghai's Society for Environmental protection, consultant to the Baogang Headquarters, and assistant editor of a magazine entitled SEAWATER DESALINATION.

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PEOPLE'S REPUBLIC OF CHINA

HOT SPRING RESORT WATER BEING USED FOR INDUSTRIES

Beijing GUANGMING RIBAO in Chinese 30 Jul 80 p 2

[Article by Yan Xueren [7051 1331 0088] and Huang Chongwen [7806 1504 2429]: "Water for Industrial Use Should Not Be Taken From Rehechuan"]

[Text] The Rehechuan [hot water spring] summer resort in the mountain town of Chengde is one of the famous hot water springs in this country. Since the water of Rehechuan is clear and relatively warm, it does not freeze in the winter. As a result, the lotus flowers in the lake at the summer resort mountain town do not wither for an extended period of time. In fact, these flowers can compete for beauty with the autumn chrysanthemums and the winter plum blossoms even after the Cold Dew [approximately 8 October]. This prompted Qing Emperor Qianlong to compose the following poem: "Lotus Flowers Can Be Seen in Midautumn, Only at This Hot Spring." The two emperors Kangxi and Qianlong wrote inscriptions for a total of 72 of the most beautiful sites in this mountain town. More than half of these inscriptions were written on the subject of either springs or water. Someone has said: "Visitors cannot appreciate the true beauty of Chengde without viewing the Rehechuan." Unfortunately, after the end of the Qing Dynasty the culvert system within the mountain town went to ruin, the water source dried up, the lakes became shallow with silt and mud, and the scenery suffered extensive damage. After liberation, however, a preliminary restoration of the scenery was accomplished, after the silt and mud were repeatedly cleaned and removed and the water source was opened up.

Later on, the municipal waterworks dug four wells to draw water for Guapu (originally Wanshuyuan), situated to the north not very far from Rehechuan. If water is drawn simultaneously from all 4 wells, 35,219 tons of water a day can be pumped, and this could dry up the source of Rehechuan. At present water is drawn regularly from only 1 well, at the rate of approximately 6,000 tons per day. As a result, the water level in the vicinity of Rehechuan has dropped appreciably and no sprays can be seen in the springwater anymore. Last winter, the water froze.

The springwater had been tested 26 times by various concerned units and was found to contain various mineral components beneficial to the human body, such as calcium, magnesium, and iron. The water was also found to be relatively soft and low in radioactivity. It is not only fit for preparation of various beverages but also suitable for life, medicine, and a broad spectrum of other applications. "Almond Dew," manufactured by the Chengde Municipal Food Factory using the water of Rehechuan, has been very well received, and many orders have come in from outside merchants. Other beverages manufactured from Rehechuan water, including "Agnile Honey Dew," "Rehechuan Daqu," and "Rehechuan Beer," are highly acclaimed by vacationers. If a large quantity of industrial water continued to be drawn from Rehechuan, production of these items will be significantly affected.

Rehechuan must be protected and the equilibrium of the entire water of the lake at this mountain town must be restored if Chengde is to remain a clean and beautiful resort town. Therefore we request that the concerned government department explore new water sources and stop drawing water for industrial use from Rehechuan as soon as possible.

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REPORTS

HAN RIVER POLLUTION—Chengde City has a river approximately 10 li long, the Han River, which cuts across the city. In the 1950's, city leaders attached great importance to the maintenance of the Han River. Many times, they mobilized the masses to clean the river of mud and silt and open the waterway, so that the Han River was kept clean. Since the 10-year great disaster, however, nobody has taken care to maintain the Han River. The river is filled with dirt and mud washed down from the mountains surrounding the city, and the waterway has been clogged for years. The riverbed downstream is almost as high as the ground of the residential district. There exists a great danger that the river will overflow its banks during the wet season. The residents along the banks of the river live in constant fear. Even worse, a score of plants situated along the banks of the river are without antipollution installations, and they arbitrarily discharge industrial wastewater into the Han River. Although a pipeline for the disposal of wastewater has been laid, some of the plants and residential areas have not yet completed the hookup. For many years, the residents living along the banks of the Han River dumped their wastewater, garbage, and nightsoil arbitrarily into the Han River; even worse, many built toilets along the edges of the riverbed. Han River used to be dry during the dry season. Today, it is a river of wastewater, with an unbearable odor that fills the mountain town. [Text] [Beijing GUANGMING RIBAO in Chinese 30 Jul 80 p 2]

REMOTE SENSING MEASURES POLLUTION—Recently an experiment was conducted in Tianjin where aircraft remote sensing technology was used for the first time in China to monitor urban environmental conditions. This experiment was organized by the Tianjin Scientific Committee and the Environmental Protection Office, and was carried out by the Remote Sensing Application Institute of the Chinese Academy of Sciences. The aircraft remote sensing experiment involved the use of many advanced sensing devices to monitor the environment over different seasonal and diurnal conditions. During the experiment, 40 monitoring flights were flown, accumulating a total flight time of over 80 hours. More than 200 pictures were taken at altitudes ranging from 3,300 to 200 meters; the pictures cover most of the heavily polluted regions of 348 square km of the city and part of the Bo Hai Bay. They were high resolution photographs showing the detailed features of each region. By analyzing these photographs and correlating them with observations made on land and at sea, the scientists will be able to reveal the major pollution sources and the conditions of damage of Tianjin City and the Bo Hai region. This information will be used for pollution prevention in the future. This experiment will be repeated during the August to September period and during the month of December. [Text] [Shanghai WEN HUI BAO in Chinese 12 Jul 80 p 2] 3012

HEILONGJIANG FACTORY POLLUTION--Over 10,000 residents of Harbin Municipality, Heilongjiang Province, sent a letter of appeal to Harbin Radio Station 22 September complaining about the toxic smoke and gases discharged by the Harbin Flint Factory which have caused serious air and water pollution and endangered their health for over 20 years. Leading comrades, including Zhao Degun, chairman of the Standing Committee of the Provincial People's Congress, Chen Lei, governor of the province, Chen Jianfei, deputy governor of the province, Wang Huacheng, mayor of Harbin Municipality, and Ni Wei, vice chairman of the Standing Committee of the Provincial People's Congress, gave instructions on this case and are very much concerned about it. A joint investigation group organized by the departments concerned has taken on this case and will soon reach a resolution. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 8 Oct 80]

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THAILAND

SALINITY OF NORTHEASTERN SOIL DISCUSSED

Bangkok SIAM RAT in Thai 24 Jun 80 pp 1, 12

[Article: "The Northeast Has Encountered a Soil Problem -- Salinity Has Spread to 14 Provinces"]

[Text] The northeast is encountering a problem of seriously spreading soil deterioration. Saline soil conditions are spreading continually and can now be found in 14 provinces. There is no other way to solve this problem besides changing the crop allocations so that the crops are suited to the soil conditions.

Mr Banchoet Phalangkun, the director-general of the Department of Land Development, has disclosed that, at present, the saline soil condition in the northeast is spreading continually. Based on the inspections that have been made, a total of 8 million rai are affected.

The salty soil makes it impossible to grow crops or causes yields to be low. At present, from the surveys, it has been learned that there is salty soil in 14 provinces: Sakon Nakhon, Udorn Thani, Nong Khai, Khon Kaen, Nakhon Phanom, Nakhon Ratchasima, Maha Sarakham, Kalasin, Chaiyaphum, Buriram, Surin, Yasothon, Sisaket and Ubon Ratchathani.

The director-general of the Department of Land Development stated that the land has become salty because of the decomposition of the soil and rocks that contain salt as an element and that lie approximately 3 meters below the surface. When the salt becomes wet, it dissolves and is then blown down from the high places and it seeps down from the foothills and becomes mixed with the soil in lower places.

As for completely eliminating the salt from the soil, Mr Banchoet stated that this is very difficult because it requires

a large investment. It is also necessary to use protective measures and measures for allocating crops that are suited to the soil conditions.

As for protecting the salty soil, a system of wide entrapment conduits must be dug in the line of movement of the salt to keep the salt from spreading to adjacent areas. Another thing that can be done is to grow plants that have deep roots in order to completely soak up the water in the hilly regions.

As for allocating crops for the salty land, the types of crops that are most convenient and that require the least capital and time include cotton, millet, sweet potatoes and asparagus, stated the director-general of the Department of Land Development.

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## THAILAND

### TEAK BURNED FOR FIREWOOD IN MAE HONG SON

Bangkok SIAM RAT in Thai 11 Aug 80 p 4

[Article by Seri Chomphuming: "What Can Be Done About the Teak, Which Has Been Chopped Up and Burned In Mae Hong Son Province?"]

[Text] If a person has a chance to travel to Mae Hong Son Province, which is a province situated on the border with Burma in the northwest of Thailand, in Mae Sarieng, Mae Lanoi, Khunyuam, Muang and Pai districts, he will see teakwood trees, a valuable type of wood, standing lifeless in the fields, gardens and villages. Most of the trees and stumps will be burned by the villagers. Sadly, this is done just because they need the land for farming.

From the trees and mountain forests that I have seen, I estimate that at least 100,000 teakwood trees, including the still standing dead trees and the trees that have been cut down in the gardens and fields of the people, have been destroyed by the villagers.

As for why such large numbers of teakwood trees, a valuable wood that brings high prices, are burned and felled, this stems from the fact that the terrain of Mae Hong Son Province is very mountainous and is covered with forests. Very little of the area of this province is flat. The province is covered with teakwood trees and other valuable types of trees. The mountains, the headwaters of the rivers, are covered with various species of trees such as white pine, "hieng" and *Dipterocarpus* that yield resin and oil. It can almost be said that every square inch of this province is covered with trees having economic value. Most of the people and villagers who live in this area must go and try to find a place to work in the teakwood forests and forests of other valuable trees. They thus go in and clear the forests to have farmland and land on which to live.

The officials responsible for guarding and taking care of the forests cannot really be blamed. As I said above, this area is almost all forest area. To really protect the forests and suppress [forest destruction], it would be necessary to move all the people out of Mae Hong Son Province.

Because the situation is like this, I would like to point out that, concerning the areas that the villagers have entered and opened up as permanent farming land, the forestry officials cannot drive them out or move them. But why have the officials remained passive and allowed these people to daily burn these valuable trees, especially the teakwood trees, for firewood? If we consider the monetary value of the losses, it certainly reaches hundreds of millions or billions of baht. The state must quickly survey and allocate this farm land so that [the people] have legal rights to the land. At the same time, it must survey the forests of valuable trees in order to entrust the Forest Industry Organization, which is a state organization, with the task of producing products, which will bring in large sums of money.

When things have been settled concerning felling the trees to make products and allocating land to the people so they have ownership rights, all the remaining forests in the high mountains, which are the headwaters of the rivers, should be declared to be permanent forest reserve areas. There should be strict measures for protecting these forests. Whoever invades these forest reserves to farm the land must be suppressed and harshly and resolutely punished because most of the villagers will already have permanent land to farm.

Speaking about the trees, especially the teakwood trees, that have been burned or cut down and left to dry, at present, I estimate that 100,000 trees have been destroyed. The average amount of lumber per tree is at least 2-3 cubic meters. The present selling price on the Bangkok market is several thousand baht per cubic meter. Think how much money the state could have earned from this!

We do not know whether the government has enough money to meet its budget. But if it could obtain this amount of money to help the budget, wouldn't this be better than squeezing taxes from the people?

If the prime minister, the deputy head of the economic sector and the minister of agriculture are interested, they should take a plane and go observe things for themselves.

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ENVIRONMENTAL PROTECTION PROBLEMS, DEVELOPMENT DESCRIBED

Warsaw NOWE DROGI in Polish No 7, Jul 80 pp 116-126

[Article by Wojciech Radecki: "Taking Care of the Natural Environment"]

[Excerpt] In the 1970's interest in environmental protection increased markedly in Poland, as it did in other socialist states. This was expressed as programmed political guidelines, constitutional changes and appropriate laws. The resolution of the Sixth PZPR Congress set the task of preparing a comprehensive program for protecting man's natural environment. This program obligated the Seventh PZPR Congress to devote more attention to environmental protection and development than had been given previously and recommended the preparation of a Sejm draft law concerning protection of the natural environment. But the Eighth PZPR Congress took up the discussed problems with greater emphasis, maintaining that their resolution would serve the implementation of the socio-economic policy goals of the party. The position of the congress, together with the resolution considering environmental protection problems on the matter of the comprehensive development of the Vistula, represents a large step towards the resolution of this key question.

How do the matters of outlays for environmental protection and the means of utilizing them stand in Poland? The data published in the statistical yearbooks show that we spent a total of 4.8 billion zlotys in 1974, 5.9 billion zlotys in 1975, 6.9 billion zlotys in 1976, 8.3 billion zlotys in 1977, and 7.5 billion zlotys in 1978 for sewage treatment plants, air pollution control, and waste disposal. The drop in outlays in the last year catches our attention. Considering that the statistics are based on current prices, and that total investment costs have increased, one is led to conclude that despite the governmental program of 1975, investment activity on behalf of environmental protection has decreased considerably.

Outlays are not adequate for actual needs. For example, expenditures for sewage treatment plants in the years 1974-1978 totaled 18.8 billion zlotys. Meanwhile, the experts cautiously estimate that the immediate improvement alone of the state of purity of Poland's waters, that is the modernization, development and streamlining of the operation of sewage treatment plants,

requires outlays exceeding 25.7 billion zlotys, and the construction of new city and industrial sewage treatment plants--82 billion zlotys.<sup>4</sup> Of course, the concrete situation has its own laws. We can wait a year or two. But for the long term, such a considerable difference between needs and outlays cannot be maintained without causing regression that is dangerous for the future.

Moreover, plans in the area of environmental protection have been carried out erratically. The plan for the years 1976-1980 envisaged the expenditure of 48.52 billion zlotys, 27.36 billion zlotys of it for water pollution control, 13.16 billion zlotys of it for air pollution control and 8.1 billion zlotys of it for neutralization of industrial waste and land reclamation. In 1976 the annual plan was fulfilled at a level of barely 55.5 percent; 1977 brought improvement--92.7 percent, and 1978--91.3 percent; in 1979, considering the "lapsed" efforts, 106 percent fulfillment of the plan was forecast. In essence, 67.8 percent of the five-year plan was achieved during these past years, and as a result, considerably more than one fifth of the envisaged efforts must be made during this last, current year. When it comes to substantive results, 24 percent of the five-year tasks in the area of the amount of dust to be contained, more than 43 percent of the growth of sewage treatment plant capacity, more than 13 percent of waste disposal, and nearly 58 percent of postindustrial land reclamation must be achieved in 1980.<sup>5</sup> It does not appear that the tasks of the five-year plan with regard to water pollution control and land reclamation can be achieved.

It is not only a matter of outlays. One of the important problems of environmental protection is the actual link of environmental protection with economic activity in all its phases. This requires a professional evaluation of the effect on the environment of an investment being prepared, assurance of frugal management of farmland and forestland in investment processes, preventing new investments from being put to use without environmental pollution control systems, and assurance of the functioning of environmental pollution control systems during production activity.

A law in Article 70, which authorizes state administrative organs to demand that the investor submit an objective expert opinion, is endeavoring to solve the problems of the effect of investments on the environment. This is not a completely new solution; one can find a similar regulation in construction law. But its application in practice leaves much to be desired, because there have been cases where an establishment really has asked for an opinion, but has begun investments without it. Such a procedure contradicts the legal obligations incumbent on the director of an establishment. It is not without cause that the resolution of the Eighth PZPR Congress emphasizes that protection of the natural environment is the duty of administrative organs and economic organizations.

A successive problem is the taking over of farmland and forestland for investment purposes. Nearly 100,000 hectares of farmland and forestland

were taken over for these aims in the years 1974-1978. This area included farmland of the highest quality. Farmland taken over for nonagricultural purposes included 2,524 hectares of Class I-III farmland in 1974; 2,113 hectares in 1975; 2,844 hectares in 1976; 3,502 hectares in 1977; and 2,156 hectares in 1978. This happened even though the order to protect farmland and forestland has been binding since 1966. In 1971 this order gained legal support, and in 1977 it was sharpened considerably (a ban on taking over farmland in Classes I-III for nonagricultural purposes was introduced; only in exceptional cases can the president of the Council of Ministers give his consent for the taking over of such land). Despite this stricter enforcement in 1978 farmland of the highest quality constituted 13.6 percent of all land taken over for nonagricultural aims.

In certain situations it is unavoidable to have the most valuable farmland taken over for investment purposes, for example in the case of the discovery of mineral deposits. Frequently, however, the taking over of farmland and forestland for other purposes is the result of the preferences of special interests, of convenience, and of reluctance to consider broader social aspects. It happens that Class III farmland remains reclassified so that it can be taken over, bypassing the stricter regulations. Even the most perfect regulations will not prevent this practice; what is needed is a profound change in awareness of and attitudes towards the matter of environmental protection.

A successive problem is to put to use investments for environmental pollution control systems which are lacking. One of the most important regulations of the law is Article 63 (subparagraph 4), according to which a newly constructed or modernized structure or group of structures cannot be made operational if the environmental pollution control systems required by the regulations or envisaged within the framework of the given investment have not been set up. This is not a new solution; water legislation and construction law contain identical solutions. But these regulations have been broken often. For example, in 1976, 29 establishments without water pollution control systems were activated, including mines, ironworks, sugar factories and hospitals.<sup>6</sup> In turn, in 1978, 23 structures without water pollution control systems and 5 structures without air pollution control systems were put into operation.<sup>7</sup> Permitting an establishment without environmental pollution control systems to operate has long been recognized as an offense by construction law. But no one has been punished for it. As of 1 September 1980 such an act will be a misdemeanor according to Article 108, subparagraph 2 of the law on environmental protection and development. But will this change in legal classification in itself bring the desired results? Even after the law of 31 January 1980 was voted one could encounter a position which essentially undermined its sense. This position is expressed in this question: Can an enterprise begin production without a sewage treatment plant? Who will dare to make a decision holding up the activation of an establishment? Usually in such cases an extended deadline is allocated for putting a sewage treatment plant into operation. Many times this deadline remains on paper only, however.

One has to be aware that allocating extended deadlines and conditions does not settle much. If an enterprise is already operating, many arguments will be found to justify the breaking of successive deadlines for delivering treatment plants. Moreover, holding up enterprise activity is a much more serious problem than prohibiting it from operating without an environmental pollution control system.

Everyone should realize that so long as there is no possibility of applying exclusively pure technologies, environmental pollution control systems will remain a very important issue. The principle of putting plants into operation jointly with environmental pollution control systems is not open to discussion. There are no economic needs which could justify violating this principle. The legal regulations themselves will not settle this issue. What is needed here is an uncompromising attitude towards the people responsible for making decisions which are at cross purposes with the legal order and with social needs.

Another disturbing issue is that of so-called old establishments which have been operating for years and which generally lack environmental pollution control systems or which have inefficient and ineffective systems. Generally available statistical data and the results of specific studies testify to the severity of this problem. They attest to the fact that the state of the natural environment in Poland is deteriorating.

Let us investigate this situation using the example of water and air pollution. Data concerning the waters of the Vistula are characteristic. Both in 1967 and 1976, the queen of Polish rivers had no water of Class I purity (designated for consumer needs); in 1967 it contained 17.7 percent of Class II water (fit for catching fish other than salmon, for swimming facilities and for the organization of recreation and water sports), 48.6 percent of Class III water (fit for industrial and agricultural purposes), and as much as 37.7 percent of water which was nonclassified and which, therefore, exceeded allowable pollution levels. But in 1976 there was no longer any Class II water; 18.1 percent was Class III water and 81.9 percent was non-classified water.<sup>8</sup> The situation with other rivers in Poland may not be so dramatic, but it is far from the desired state. It is also well known that the state of purity of lakes and subsurface waters is deteriorating. The basic reason is the unresolved problem of sewage.

In 1978, 4.6 billion m<sup>3</sup> of sewage required treatment. More than 40 percent of sewage in general was not treated, and one third more or less was treated only mechanically. Since 1976 the growth rate of the amount of sewage generally not treated (1,675,900,000 m<sup>3</sup> in 1976; 1,767,300,000 m<sup>3</sup> in 1977; and 1,994,200,000 m<sup>3</sup> in 1978) has been more rapid than that of sewage requiring treatment and significantly more rapid than that of treated sewage. The deterioration of the state of water purity is all the more threatening for us since Poland is among the countries poor in water resources; the available water resources per resident in Poland are becoming comparable with the resources of...Egypt.

It follows from the statistics that 458 of 803 Polish cities had no sewage treatment plants in 1978, including 5 cities with populations of 100,000 to 500,000 and 2 cities with more than 500,000 inhabitants (one of them being Warsaw).

Data from the Environmental Development Institute show that among currently operating sewage treatment plants, the most numerous are mechanical plants of low level efficiency. Only 27 percent of the plants are operating in accordance with the requirements established by organs of the administration. Overloaded sewage treatment plants make up 40 percent of the operating structures.<sup>9</sup>

We should not consider these complex problems in an abstract way. The reasons for the state of affairs to date are complex, as Poland's entire history is. They have been formed not only by the decades, but also by the centuries. But aside from all the obstacles which can be rated as objective, difficulties of a subjective nature make themselves known in a powerful way.

The State Council for the Protection of Nature asserted in the resolution adopted on 11 December 1978 that in the frequent conflicts between the interests of industry which does not take into account the harmful effect on the environment and the need to respect binding law, the assumptions of the government program are not implemented adequately, and the general social values of the environment are rarely included in cost effectiveness analysis.<sup>10</sup>

It would be unjust to think that there are no economic instruments in Poland serving environmental protection. On the contrary, there are such instruments, and there are many of them. For a dozen or so years financial penalties have been known to be meted out to establishments for infringing waste discharging conditions and for exceeding the limit for dust emitted into the atmosphere, and there have also been charges levied for water consumption and discharging of sewage, and also charges for taking over farmland and forestland for nonagricultural and nonforest purposes. Industrial establishments also are penalized for environmental damage, especially damage to farm harvests and to forests. As for environmental damage to forests, there is, moreover, a highly rated mechanism for agreements concluded between units managing forests and industrial establishments which allows for counteraction and repair of damage. Three specific funds have been formed: water, agricultural, and forest, in which assets serving environmental protection are amassed.

But why does the system of economic stimulation not function properly? The fundamental reasons for the weakness of the system of penalties, charges and damages lie in the incompleteness of the economic and financial solutions. This is evident for example in the penalties meted out for exceeding conditions concerning sewage. If in 1972, 410 establishments were penalized, and total penalties amounted to 35 million zlotys, in 1975,

677 establishments were fined a total of 103.5 million zlotys; and in 1977, 1,300 establishments were fined, and total penalties exceeded 300 million zlotys. The effect of these penalties is negligible, since they can be characterized as a "transfer of money from one state pocket to another."

The legal assumption according to which those penalties encumbering the economic results of an establishment induce it to invest in environmental protection has not been tested, because achievement of the plan affects the evaluation of an enterprise's activity to a decisive degree. The situation has been and is possible in which an establishment pays millions of zlotys in financial penalties for destroying the environment, but fulfills the plan, for which the leadership of the establishment receives bonuses. That is why financial penalties turn out to be a sham. Only increasing the role of economic mechanisms and of the financial system in the functioning of the economy, strengthening the role of money, improving establishment economic accounting and cost accounting--measures announced at the Eighth PZPR Congress--can lead to the raising of the status of economic instruments whose use also will foster environmental protection.

It is a sad paradox that now and then it simply is profitable for enterprises to destroy the environment. This can be seen using the example of getting rid of electric filters with the goal of saving energy, which is painfully reflected in Poland's timberland. It is worth realizing that at present Poland has more than 8,500,000 hectares of forests, of which 365,000 hectares were forests damaged by industrial emissions in 1978. In 1990 nearly 200,000 hectares of forests will be threatened directly by industry, according to estimates.<sup>11</sup>

But can one ask the director of an enterprise to act against the interests of his own establishment and his own work force, dependent on saving current "at any cost"?

Here is another example. When it comes to the damage of treatment plants in an establishment, the director has two alternatives: either hold up production until the damage is eliminated and thereby protect the environment, causing losses in production, depriving his work force of bonuses, etc., or do not hold up production, leading to harm to the environment, but insuring the fulfillment of the plan, which will allow bonuses to be obtained. How many directors will pick the first solution, when the economic system is built on the second solution? The director should then be changed in order to make it easier, and not harder, for the manager to make decisions consistent with social interests and with the interests of his future generations.

The question of how to do this involves particular solutions. In any case, it is a matter of bringing things to the point where actions detrimental to the environment will never be profitable. This can be achieved, for example, by adopting and implementing the principle that production results

achieved at a cost to the environment are not counted when fulfillment of a plan is evaluated.

The majority of environmental protection problems concern economic questions. Therefore, it is worth reflecting on this question: Should environmental protection be profitable? I think it is good if it does pay off. This happens, for example, when production waste is treated as secondary raw materials instead of remaining in dumping grounds. But it does not follow that environmental protection always must pay off in a literal sense.

Production of sulfuric acid from the sulfur dioxide retained in plants can be one of the examples illustrating this thesis. The experts maintain that sulfuric acid produced from sulfur will always be better and cheaper than sulfuric acid which may possibly be produced from sulfur dioxide. Does it follow from this that further research on retaining sulfur dioxide and on producing sulfuric acid from it should be abandoned? Of course not, since "ecological" profitability must have priority here over "economic" profitability.

Another example concerns the concepts, resurrected from time to time, of intensifying agriculture in Kampino National Park or of again introducing sheep into Tatra Park. It should be stated clearly: The question whether agriculture in Kampino Park or sheep raising in Tatra Park "is profitable" is in general badly phrased. There is no room here for resolving the problem in terms of profitability in one-zloty coins. There are certain inviolable values, and among them are the values of the national parks, which cannot be sacrificed for any on-the-spot purposes.

Moreover, serious problems arise not only in the preparation and carrying out of economic activity, but also following its conclusion. In this phase, the issues of reclamation and development of post-industrial land are among the most important. The statistical data show, for example, that in 1978 there were 75,500 hectares of post-industrial land requiring reclamation and development, of which 5,500 hectares (7.5 percent) were reclaimed, and 4,200 hectares (5.5 percent) were developed. Data for the years 1974-1977 are approximately the same. Thus, actual activity in the fields of reclamation and development continues to fall short of needs.

There is no doubt that the state of the natural environment in Poland is deteriorating despite many efforts. This process must be brought to a stop and reversed. It is all the more important, since the gravity of the problem has been duly appreciated by the highest party and state quarters. We have at our disposal a modern, comprehensive law on environmental protection and development, and at the Eighth PZPR Congress the framework was defined for an environmental protection program which was vested with the rank of a task directly serving implementation of the social and economic policy of the party.

On the other hand, however, environmental protection has not yet been linked with economic activity, and the economic system does not foster

resolution of conflicts in a direction consistent with environmental protection interests; in many cases it gives the advantage to narrowly understood, on-the-spot economic interests. There continues to be a lack of general awareness of the problem among economic and administrative cadres. In economic decisions there frequently come to be voiced special interests expressed in the striving to obtain economic gains even at the cost of environmental degradation; now and then environmental protection is treated as a harmful matter of basic economic activity of minor importance.

At present it is a matter of having the resolutions of the Eighth PZPR Congress and the law on environmental protection and development implemented consistently in practice. First of all, considerable changes in the system of planning and managing the economy are indispensable to this end. It is a question of a well-conceived "application of ecology" in subsequent economic development, of eliminating solutions giving the advantage to an on-the-spot economic consideration over environmental protection interests. In practice, it is a matter of changing the system for evaluating the activity of economic units and of saturating it with ecological criteria tending to view the issue of profitability of economic undertakings and the system of worker awards and bonuses more broadly, in order to eliminate situations in which destruction and degradation of the environment are profitable.

Secondly, the application of organizational and economic mechanisms ought to be supported by activity aimed at forming, among the managerial cadre, an economic and political conviction concerning the need for efficient undertakings on behalf of environmental protection; after all, Poland is not limited to the perspective of the next 5 or 10 years...all the more so since in the future such goods as clean water and air, the possibility of contact with living nature, etc., will not be less important than goods satisfying consumer needs. Consequently, the idea of protecting the environment surrounding man should become part of social thinking. The law on environmental protection and development, the amended code of administrative procedures, and also some regulations of the civil code provide a basis for this notion.

Every citizen can implement his own constitutional right to protect the value of the natural environment through the complaints and motions provided for in the code of administrative procedures or also, in valid cases, by appealing administrative decisions in court. There is also the possibility of using the civil-legal institution of protection of personal goods with the goal of acting on behalf of environmental protection.

The law on environmental protection and development grants to the self-government of urban and rural residents, to workers' self-government and to trade unions and other social organizations the right to undertake actions fostering environmental protection and the use of its value by citizens. These organizations can appeal to the appropriate state

administrative organs for the means necessary to remove factors endangering the environment. State administrative organs have been obliged to inform interested social organizations about investment undertakings being prepared which have an impact on the environment, and to provide assistance in activities serving environmental protection.

By the nature of things, particular tasks in the discussed field lie in party organizations and echelons. To raise ourselves above immediate narrow-minded and ministerial interests, and to react in the spirit of socialist assumptions and principles to all signs of socio-economic development--these are among the uppermost obligations of the guiding force of the nation.

#### FOOTNOTES

3. "VI Zjazd PZPR. Podstawowe materiały i dokumenty" [Sixth PZPR Congress. Basic Materials and Documents], Warsaw, 1972, p 252. The result of the resolution voted by the congress was a program of environmental protection until the year 1990 prepared by a team of experts and approved in 1975 at the meetings of the Council of Ministers and the Political Bureau ("The Environment Today and Tomorrow," AURA, No 7, 1975, pp 1-5); "VII Zjazd PZPR. Podstawowe materiały i dokumenty," Warsaw, 1975, p 236; "VIII Zjazd PZPR. Podstawowe materiały i dokumenty," Warsaw, 1980, p 173.
4. "The Sad Image of Sewage Treatment Plants," AURA, No 4, 1978.
5. "Planning and Implementation of Tasks in Environmental Protection," AURA, No 2, 1979.
6. "Deterioration of Water Quality," AURA, No 10, 1977.
7. "More and More Dust and Gasses in the Air," AURA, No 11, 1979.
8. Z. Szelagowski, "Water Protection in the 'Vistula Program,'" PRZYRODA POLSKA, No 9, 1979, p 5.
9. "The Sad Image of Sewage Treatment Plants," AURA, No 4, 1978.
10. "Resolution on the Matter of the General Evaluation of the State of Emergency and of Protection of the Natural Environment and on the Matter of Directions of Activity to Improve Its Quality" (CHRONY PRZYRODE OJCZYSTA, No 4, 1979, pp 44-48). In this same resolution the State Council for the Protection of Nature calls attention to the practice of excluding water and air pollution control systems to achieve better economic results, the disturbing increase in damages in forests as a result of the negative action of industrial dust and gasses, the threat to the most valuable natural structures, which the

national parks and natural preserves are, and the insufficient rate of progress of efforts at reclaiming and managing post-industrial land.

11. See W. Milewski: "Let Us Enrich the Green Resources of the Country," PRZYRODA POLSKA, No 4, 1980, p 3.

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CSO: 5000

## ELECTRICITY CORPORATION DENIES POLLUTION CHARGE

Nassau THE TRIBUNE in English 19 Sep 80 p 1

(Text)

THE Bahamas Electricity Corporation today strenuously denied that the fuel, off which its new equipment is to operate, will have any harmful affects on the environment.

"It's the same fuel we've been using for 20 years and we've never had any complaints from the Environmental Health Department," Peter Bethel, general manager, said.

Residents have become concerned that Bunker C, a heavy residual fuel oil, might have an adverse affect on the environment after hearing reports about its use in the US.

Just last month, BEC announced that it had ordered \$26 million worth of new equipment, which could operate very efficiently using Bunker C. This type of fuel is currently only half the price of diesel fuel.

However, asked about possible pollution, Mr Bethel said that BEC has been using Bunker C as well as diesel oil at its Clifton Pier plant for the past 20 years. When it arrives, the new equipment will be

housed in a plant that is to be built alongside the existing one at Clifton Pier.

"Bunker C can have either a low or high sulphur content. We in fact use the fuel with the high sulphur content because of cost considerations," Mr Bethel said.

"We are presently using this type of fuel at Clifton Pier. In fact, we have been for the past 20 years. All we are going to do is continue using it. We are going to use it in the new plant.

The net result is that it will only be used marginally more."

"No doubt high sulphur fuel can cause pollution," Mr Bethel said. "But you have to consider the particular site, it's being used at."

For instance, he said high sulphur fuel used in New York would "fall-out" on the land. In addition to this, New York is a densely populated city.

The Clifton Pier plant, on the otherhand, is located on the western part of the island and the prevailing winds are from the east. Any fuel used there falls out over the ocean.

CSO: 5000

DOMINICAN REPUBLIC

BRIEFS

FISH POISONING BY CHEMICALS--Santo Domingo, 5 Oct (EFE)--The director of fishing resources of the Dominican Ministry of Agriculture has confirmed that millions of fish along the Dominican, Puerto Rican and Mexican coasts as well as other coasts of Central American and the Caribbean were poisoned by chemical substances. Captain Almonte Capellan said that the analysis to which many of these fish were submitted at the organization he directs reveal that they died after ingesting chemical substances such as phosphates, sulfides and chlorides. Almonte Capellan, who is also a marine biologist and a former chief of the navy's oceanography section, pointed out that the fish that were analyzed did not die "for biological reasons, as stated by Francisco Pagan Font, director of the Puerto Rican Marine Resources Corporation." [Passage indistinct] [Text] [PA060340 Madrid EFE in Spanish 2037 GMT 5 Oct 80]

CSO: 5000

AUTHORITIES CLAIM FISH POISONED BY PESTICIDE

Bridgetown ADVOCATE NEWS in English 20 Sep 80 p 3

[Text]

KINGSTON, Jamaica. Friday, (CANA) - Jamaican authorities say schools of dead fish found off the island's east coast last weekend were poisoned by a pesticide or its by-products.

A Government statement said confirmation of this diagnosis had come from the fisheries division of the Ministry of Agriculture.

The Minister together with the natural resources conservation division of the Ministry of Mining, had sent a team of scientists to Moreast Cays to test the fish and water in the area.

The statement did not identify the insecticide but said further tests were continuing.

In the meantime a two week Health Ministry ban imposed Monday on the distribution and sale of fish from the area will remain in force.

Fishermen have been advised not to collect or land any dead or struggling fish found in the waters off the east coast cays.

The ban, followed the discovery of a large amount of

dead fish on the cays. There were suspicions here that the fish could have been poisoned by a current of toxic water flowing from the Eastern Caribbean.

Similar findings of dead fish have been reported by authorities in the Dominican Republic, Cayman Islands and Miami.

At least one death was reported to authorities in the Dominican Republic, where millions of dead fish were found floating on the north coast September 9.

Scientists in Puerto Rico had suggested that the fish kills might have been caused by a marine condition called red tide.

This is caused when certain algae multiply at an alarmingly high rate, tinging the ocean red and consuming so much oxygen that fish literally smother to death.

A spokesman for Jamaica's Agriculture Ministry said samples of fish and water are being taken all along the island's north and south coasts on a daily basis.

CSO: 5000

BAHRAIN

BRIEFS

ENVIRONMENT COMMITTEE DECREED--Recently, Amir Shaykh 'Issa ibn Salman issued a decree providing for the creation of an environmental defense committee. [Text] [Manama AL-MAWAQIF in Arabic 8 Sep 80 p 4]

CSO: 5400

CAPE VERDE

BRIEFS

REFORESTATION CAMPAIGN--The first rains have already started around the country, and some parts have received more than had been seen for a long time. Hopes for a better agricultural year are on the rise; the people consider it a good omen that the rains arrived earlier than usual--end of July, middle of August. The Reforestation Campaign 80 inaugurated by comrade Pedro Pires continues to mobilize soldiers, the young and students on vacation, public servants, party and mass organization militants who are all going to the rural areas on week-ends to plant trees. Approximately 1.5 million trees will be planted in Cape Verde, an average of seven trees for each person old enough to participate in the campaign; this number is higher than the number set for other parts of the Sahel. It should be noted that the rate of increase of trees to be planted has remained stable, with half a million in 1978, one million in 1979 and 1.5 million this year. A total of 800,000 trees will be planted in Santiago this year, while 135,000 have already been planted in Monte Vaca, and 1,050 hectares have been planted in Achada do Mosquito. [Excerpts] [Bissau NO PINTCHA in Portuguese 18 Sep 80 p 3]

CSO: 5000

**FREAK HAIL STORM DAMAGE REPORTED**

Salisbury THE HERALD-BUSINESS HERALD in English 2 Oct 80 p 13

[Text] Business firms and householders in Salisbury were yesterday counting the damage of Tuesday's freak hailstorm in thousands of dollars.

Insurance companies in the city were inundated with claims against hail and stormwater damage and glass merchants said they were unable to cope with the demand for window pane and car windscreens replacements.

A spokesman in the claims department of a major insurance company said: 'We have never had things so bad. We are inundated with claims to the extent that our telephone switchboard has been jammed.'

The worst-hit areas appeared to have been Greendale, Greystone Park and Hatfield although reports of damage were being received from all areas, he said.

The manager of a glazing firm, Mr C.W. McCoun, said thousands of window panes were reported broken during the storm.

'One factory at Msasa had 200 panes broken and several cars had windscreens damaged. We will be extremely busy for the next few weeks and have already had to turn people away since we cannot cope.'

A spokesman for another glazing firm said one Greystone Park home had 119 broken panes.

'We have never experienced anything like this before and it will take a month before all the damage is repaired.'

The hailstorm hit Salisbury at about 5.15 p.m. on Tuesday. In 10 minutes it devastated gardens, stripped trees and caused thousands of dollars worth of damage to Landscape Nurseries in Glen Lorne.

The propagation manager, Mr Kerry Wallace, said most of his plants had been extensively damaged.

Damage to tobacco seed beds in the Darwendale area was also reported, a spokesman for the Zimbabwe Tobacco Association said.

A police spokesman said yesterday Mr Tseriwa Kanyongo (37) of Aintree Circle, Belvedere, was killed when struck by lightning while walking with a friend at the corner of Rhodes Avenue and Snowdon Road on Tuesday evening.

Hailstones of between 25 and 30mm in diameter fell over the city in what a spokesman for the Meteorological Office described as "the heaviest hail-storm I have ever seen."

He said temperatures fell from 25 deg. C to 14 deg. C and a wind gust of 41 knots had been recorded at Salisbury airport.

No more hail is expected and temperatures are expected to rise.

#### Storm Shreds Wheat Crop

About \$40 000 worth of damage was caused to a wheat crop belonging to Mazoe farmer, Mr Peter Black, when a freak hailstorm struck his farm late on Tuesday afternoon.

Most of the 100 ha wheat crop on Mr Black's Maryvale Farm was devastated when hail cut like a scythe through his lands, shredding leaves off the trees and killing wild birds.

The hail chipped paint off the roof and walls and smashed all the windows on one side of his homestead, nestled between the Mazoe hills, about 25 km from Salisbury.

It also struck the adjoining farm belonging to his brother, Mr A.C. Black.

#### Potatoes

More than \$4 000 worth of damage was caused to a potato crop which was in the flowering stage, he said.

Mr A.C. Black said it was the worst storm he had seen in the 40 years he had been on the farm. "Some of my staff have been here longer than that and none of them have seen anything like it before," he said.

Mr Black said his wheat crop was "a total write-off."

He said many of the hailstones were about the size of a squash ball.

"It will affect my whole budget," he said. "The damage caused by the hail will set me back for the next 12 months."

The wheat crop, which cannot be insured in this country, was planted early in June and reaping operations would have started in about 20 days' time.

CSO: 5000

INTERNATIONAL AFFAIRS

FINLAND EXAMINES DANISH HAZARDOUS WASTE LAW AS MODEL

Helsinki SUOMEN KUVALEHTI in Finnish 3 Apr 80 p 82-83

[Article by Aatos Alhainen: "Finland Urgently Needs an Establishment for Hazardous Wastes"]

[Excerpts] The amending of the waste disposal law comes up for consideration by parliament during the second week of April 1980. When the law goes into effect Finland will be required to have a hazardous waste disposal establishment in some stage of operation by 1 April 1982.

Therefore Finland is destined to have a nation-wide collecting organization and disposal establishment for hazardous wastes. Should everything proceed according to plan, Finland can gain from the Danish experience and perhaps succeed in building the most modern disposal system in the world and possibly even sell abroad some of that information.

Denmark is the pioneering country of the world in the field of nationwide collecting and disposing of hazardous wastes. The system there has been in operation for nearly 10 years.

The decision as to where in Finland the establishment is to be built has not yet been reached. Many localities have refused that honor. The places that appear to be at the head of the list at this time are Riihimaki, Hameenlinna, and Hyvinkaa.

Fear exists in regard to hazardous waste establishments for various reasons. All of them are quite unfounded, Danes say from their own experience. The Danish establishment, the Kommunekemi a/s, slipped into the old cultural city of Nyborg as if by stealth through a back door. This city, capitol of Denmark for 700 years, gained this establishment employing 87 persons almost without public notice.

The operations of the Kommunekemi, which at first handled oil wastes, began in an old tar rendering plant. At present all of the hazardous wastes that private establishments do not dispose of are collected and brought there.

The private organizations either dispose of the substances or reclaim the most valuable oils and materials that can profitably be reprocessed as raw materials. The most obnoxious substances are stored at the Kommunekemi. Those poisonous substances that cannot be processed are disposed of, for the time being, in abandoned German salt mines.

"I see this as an important new and fruitful collaborative objective in the Nordic countries," says operations manager Folke Aarnio of the Suomen Ongelmajateyhishio, a Finnish hazardous waste disposal firm.

"It is not worthwhile for a single country to make the investment needed to establish a plant to dispose of the most obnoxious wastes because, fortunately, few of these wastes are produced. But four countries together do produce enough of them to justify one operational plant."

#### Dangers of Hazardous Wastes Exaggerated

In public discussions hazardous wastes are frequently equated with radioactive wastes. Hazardous wastes are formed primarily as side products of the chemical industry and from various types of waste oils.

According to an obviously cautious estimate by technical manager John Toffner-Clausen of Kommunekemi Denmark annually accumulates about 50,000 tons of waste oils and another 50,000 tons of other hazardous wastes. Of the waste oils, only 15,000 tons reaches treatment of Kommunekemi and approximately 40,000 tons of the chemical wastes end there.

According to chief Olli Ojala of the Environmental Protection Division of the Interior Ministry, these qualities are larger in Finland. Only about 3,000 tons of oil are reclaimed from waste oils in Finland. Finland will require a plant larger than the one existing in Denmark.

The profitability aspects of Kommunekemi suffer because it does not enjoy monopoly rights. Practically no recyclable raw materials accrue from its operations. The greatest benefit derived from it consists of heat energy, which was a factor that assisted in its approval by the residents of Nyborg. The plant currently provides heating for 35 percent of Nyborg at a favorable cost. After completion of a planned expansion, this plant will supply 60 percent of the heating requirements of this city of 18,500 residents.

In the opinion of John Toffner-Clausen, the word "poison" is too frequently associated with hazardous waste. His plant operates under rigid norms and stringent supervision. No ill effects to humans, flora, or fauna have ever been traced as arising from its operations. Environmental protection

occupies first place in its operational principles and profitability is only secondary. The plant planned in Finland will operate under practically identical rules.

In Denmark the collecting of the hazardous wastes is done at the expense of the administrative communes, which also mainly finance the operations of Kommunekemi. The collecting organization consists of 22 area-wide collecting centers, which are located adjacent to railroad lines. Each commune has a hazardous wastes receiving point from which the wastes are taken to an area collecting center. The Kommunekemi has 115 rail freight cars of its own. Highway transportation is also used. No accidents of serious proportions have occurred.

In Denmark, as also in Finland, regular freight consignments containing far greater amounts of poisonous substances are shipped daily by rail than the amounts contained in the hazardous waste shipments.

There is also fear that hazardous wastes may create odors. The Kommunekemi plant is always blamed whenever a slightly unusual odor occurs in the city. The plant management does admit that at times odors may be released when the "goods" are being transferred from transportation facilities to processing facilities. This obstacle can be eliminated in Finland because Finland can benefit from the Danish trial-and-error experience. The Danish hazardous waste firm now has its own engineering office that generally manages the visiting at the establishment and sells the know-how that has been gained there.

During 1973 approximately 25 million Danish krone were invested in Kommunekemi facilities. The figure at present is 90 million krone and after the upcoming expansion it will be 170 million krone. The communes of Denmark have extended a loan of 135 million krone without interest. This amount is to be paid back to the communes in early 1985, or at least that portion of it that was extended during the period 1973-1980.

In 1973 a cost estimate for a hazardous waste disposal plant was made in Finland. The final figure for that was 55 million markkas. Today that figure would barely suffice for the construction of a burning disposal section, a laboratory, and office space.

Funding in Finland is planned through normal loan arrangement with government backing. Unlike Sweden, monopoly operation is not planned in Finland either.

The belief is that the amendment that is needed in the waste disposal act will not become a subject of political contention. A small amount of controversy could arise from the extent that the law will restrict the granting of permits for waste disposal to organizations other than the official Suomen Ongelmajateyhtio.

PROFESSOR ATTACKS ENVIRONMENT AGENCY OVER CLEAN-UP RECORD

Copenhagen INFORMATION in Danish 19 Sep 80 p 8

[Article by Dr and Engineer Arnulf Kolstad, a professor at the Aalborg University Center: "Superficial Work by the Environmental Administration"]

[Text] The Environmental Administration recently brought out a report on the effects of environmental reform, and in that connection it desires a broader debate on what ought to be the central problems to be tackled by environmental-protection work during the coming years.

That is a discussion there is considerable need for, since it embraces social problems which are constantly increasing in importance and scope, but before complying with the Environmental Administration's invitation to look forward into the future, it may be useful, as a beginning, to look backward, asking the reason why environmental pollution has increased so sharply during the current century, why it was necessary to pass an environmental-protection law in 1974 and whether that law is having any effect upon the more basic, social reasons why nature is being contaminated and polluted.

Reasons

Thus, when the Environmental Administration, quite correctly but not too acutely, perceives pollution of the environment as a serious ecological problem, it was natural for it also to seek the reasons why that had happened. The Environmental Administration also was of that opinion, as far as that goes, when it wrote, in 1974, "The reason for many problems of pollution can be traced back to the fact that the environment has not been taken into consideration sufficiently in the planning which has been done up to the present..." The Environmental Administration has never thought any more deeply or acutely than that with regard to the causes of pollution and the devastation of the environment. That statement can be compared with attempts to explain the cause of cancer by pointing out that the planning carried out by the health services is too poor. And then there are also the means which are used which must be considered. They consist, in general, of prohibitions, laws of all kinds, regulations and

other bureaucratic measures which, again, can be compared with attempts to cure, or do away with, a disease by forbidding the symptoms.

If environmental-protection work is to manage to do something drastic and necessary in the way of preventing the contamination of the water, the air and the soil, an entirely different understanding of why nature and the human environment are threatened is required than the one presented by the Environmental Administration.

Contamination of private households can be described as indirect contamination caused by industrialization. It is the result of the concentration of the population which was caused by the special course taken by industrial production and was not present to the same extent in the precapitalist/preindustrial society.

#### Wastes from Industrial Enterprises

Direct contamination from industrial production increased simultaneously in scope and changed its nature concurrently with the introduction of new raw materials, production processes and products. With the growth in industrial production, an increase in the amounts of waste also took place, but the composition of the quantities of waste is just as important as the volume where environmental pollution is concerned.

Qualitatively, new quantities of waste came into being as a result of the processing of imported raw materials, such as galvanizing, the "freming" of alloys, etc.

At the beginning of this century, pollution from the chemical industry was not especially different from the organic and mechanical pollution in the other branches of industry--the food and beverage branches, for example. The branches of industry which were polluted in other ways, such as the paint, glue, superphosphate and drug industries, played a modest role at that time.

#### Tremendous Growth

But during the period following World War I a tremendous growth took place in the branches of industry where organic pollution was a factor in production. At the same time, entirely new branches of industry, such as the petrochemical industry, where established and experienced tremendous growth during that period. As a result, chemical pollution came into being as a problem with a vengeance, and environmental pollution changed not only quantitatively but also qualitatively.

The seriousness and the significance of that type of pollution is clear from a Nordic Council report which stated: "Approximately 100,000 chemical products are used in Finland at present. About 1,000 new products are brought onto the market every year, and approximately 100 new chemical

dealers along with them. A current example is vinyl chloride. It is only during recent years that a connection between the damage and the delivering of the product was established, in spite of the fact that the material had been used in the production of PVC plates for nearly 20 years."

Environmental problems resulting from the growing and changing production process are also aggravated by the urbanization--that is, by the concentration, both of the population and of production--which has taken place. The increasing pollution is concentrated in smaller and smaller areas.

Therefore, if we look for the actual causes of the increased pollution and the more and more striking devastation of the environment, we must study the way industrial production is developing, the production processes which are set in motion, the technological development, the raw materials which are used and frequently unknown-waste materials which are liberated into the environment. It is there that we will find the reasons for the increasing pollution. If production has to develop in as chaotic a manner as it has done up to now, without assigning more importance to what we can call the useful value side of production and qualitative consequences, the danger of increasing and more unpredictable derangement of the environment will become more and more of a threat.

Pollution has approached a level where harmful effects are quite general and affect all social classes, and not just the working class, as was formerly the case.

The fact that the complex environmental problem today has turned around, as it were, and is concerned with human living conditions (mankind's environment) to a greater extent, is partially owing to the fact that pollution is close to attaining such dimensions that not only the working class but also the bourgeoisie are affected by it, as social research worker Johan Galtung says.

Harmful effects of pollution are also gradually coming to constitute a threat to the way industrial production will be conducted in the future, and particularly in the fishing and agricultural industries, which are hampered by pollution of the soil and the water, the eutrophying of the water-courses, etc., but also in industry, with increased damage from corrosion, among other things.

As long as individual industrial enterprises cannot be expected to take action against the devastation caused by pollution, both because their own contributions to pollution are too small in relation to total pollution and because that would cause a dislocation of competitive conditions, since the cost of environmental protection would reduce those enterprises' profit-making capabilities and go contrary to the individual enterprises' pursuit of their specific objective of maximum profit, it is necessary that the government or the public take steps to intervene.

## The Means Available to the Government

But in order for the government's intervention to be effective it is necessary that it tackle the causes of the problem and not just the symptoms indicating that a problem exists. However, the means the state makes use of in regard to pollution of the environment are not directed against what is causing the problem--that is, the uncontrolled competition among individual industrial enterprises and the nearly uncontrolled development of technology and industrial processes. The state tries to reduce the harmful effects, chiefly by means of the following three means: (a) legislation, (b) economic support or economic sanctions and (c) planning.

None of these goes to the root of the problem.

The effect of these efforts is apparent from a report the Environmental Administration prepared on the effects of environmental reform--an attempt to indicate the status of environmental-protection work.

According to the Environmental Administration, it is assumed that planning--space and regional planning, for example--will be the most important controlling instrument in achieving the desired environmental quality. But that form of planning comes into open conflict with an economic system based on free competition. Governmental planning of the commercial system, both where the locating of industrial enterprises and determining what they shall produce and how they shall produce it are concerned, will be in conflict with some of the fundamental principles on which the capitalistic method of production itself is based. That development will scarcely bring about a more decentralized democracy based on industrial production, but rather a bureaucratic, centralized decision-making instrument more and more firmly controlled by the government. Control of production and its effects which is more in accordance with a plan is necessary, but the solution to the problem does not lie in confirming that a start has been made and attempting to retain capitalism. Both parts of this picture are symbolic of the same wretched situation.

## 1.6 Billion Korner for the Environment

In 1978, total expenditures for fighting pollution in Denmark amounted to approximately 1.6 billion kroner. It expenditures made in connection with sewerage and disposing of wastes are included, approximately 3 billion kroner, or the equivalent of approximately 1 percent of the gross national product, in all, are used in the area of environmental protection each year. Thus, seen from a socioeconomic viewpoint, environmental protection is of little significance. Therefore it can be concluded that society can "afford" to invest a great deal more money in improving the environment without affecting the country's total economy to an appreciable extent.

According to the Environmental Administration, the government, business and consumers each paid one-third of the cost. Although theoretical objections can be raised against such an apportionment of the burden, the report shows that industry, which obviously is responsible for most of the pollution, is getting off cheaply. Total expenditures for environmental protection amount to less than one-fourth of 1 percent of Danish industrial turnover, and thus they are of marginal significance for Danish industry's competitiveness.

#### Slight Effects

Then what effect did these expenditures for antipollution measures have?

In the Environmental Administration's report, it is stated that certain pollution problems of a general nature, such as pollution of the air with sulfur dioxide and soot, were successfully curtailed in Copenhagen, but that it is difficult to perceive any improvement elsewhere. Where the air's nitric oxide content is concerned, an increase took place, and that is something that is alarming from both the environmental and the health points of view. Increased washing out of nitrates in the watercourses and the other groundwater strata was also perceived, and that is something which is very dangerous in the long run with respect to groundwater quality, and consequently with respect to the water supply. The dispersion of heavy metals is still a serious problem. Lead and mercury have occasioned cases of poisoning among animals. Whereas a slight, but not pronounced, improvement in the quality of the water flowing in streams could be observed during the period from 1972 to 1976, the conveying of organic material to the ocean increased.

#### Not Sufficient

All in all, neither the environmental reform nor the 3 billion kroner per year seem to be sufficient to prevent the environment and nature from being polluted to an increasing extent. But before expending even more money and bureaucracy on symptom-treating activities of limited value, it is necessary for us to go to the root of the problem--that is, to take under consideration the question as to whether it should continue to be the case that the individual industrial enterprises determine

--the raw materials with which they will carry out production,

--how production is to be carried out and

--what shall be produced

without taking the social consequences of that production into consideration to a sufficient extent.

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CSO: 5000

STUDY TO LOOK AT SAIMAA CANAL ECOLOGICAL SYSTEM

Helsingin UUSI SUOMI in Finnish 26 Mar 80 p 6

[Article: "Saimaa Ecosystem Subject of Study"]

[Text] A study of the Saimaa water system is necessary before the new fishing regulations are put into effect. The Waterways Administration is to undertake during 1980 a study costing 1.3 million markkas overall to determine the effect that the regulating of the catch has on the fishing industry.

The Mikkeli provincial government and the members of parliament from that area have made a proposal to the Ministry of the Interior that a separate ecological research establishment be set up for the Saimaa system.

On 25 March the Waterways Administration announced in Savonlinna that 465,000 markkas had been allotted to begin the study. The city, however, has not yet offered operating space for the research establishment.

The study, which will be carried out during 1980-1982 in four differing Saimaa system areas, namely, Pyhaselka, Puruvesi, Lietvesi, and Etela-Saimaa, consists of an investigation of the effects of fishing on the ecosystem of Saimaa lake. In respect to the fishing, all of the households of the approximately 500 professional fishermen in the area and the 10,000 households that fish for home use and for recreation will be queried. For a record of the catch, 80 professional fishermen whose methods of fishing represent those used in the area will be engaged.

According to Waterways Administration biologist Pertti Seppanen the ecosystem investigations will concentrate on the most obvious causal relationships between regulation and the fish catch. The catch and fishing studies are needed in order to arrive at an estimate the effect of the regulating on the fishing economy.

After completion on the basic phase of study lasting about two years the investigation will be continued in the next period of regulation, during 1988-1990.

The proposal to practice regulation in the Saimaa waters system has encountered opposition among environmentalists and those who gain their livelihood mainly from fishing.

They brand the plan as serving the interests of the hydroelectric industry. The regulating plan, which aims to level down the flood-stage peaks and raising the lower levels would, accordingly to the environmentalists' views, increase the rate of water exchange, and that is not good for the fishing industry.

The application for the regulating of the Saimaa lake system will be simultaneously /sic/ submitted before the Ita-Suomi district water rights court, accordingly to division engineer Markku Ollila of the Waterways Administration. An opportunity for interested parties, such as the Saimaa shoreline residents, to present their views concerning the proposition will be provided during the permit application proceedings by the court.

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RESEARCHER EXAMINES FOREST INDUSTRY EFFECT ON WATERS

Helsinki HELSINGIN SANOMAT in Finnish 2 Apr 80 p 2

[Article by Pertti Hynninen: "Useless To Operate on Basis of 'Just in Case' in Regard to Environmental Protection"]

[Text] Pertti Hynninen, licentiate of technology and specialist in the planning of environmental protection for the cellulose and paper industries. He also participates in the industrial waste water projects of Sitra, the fund for the anniversary observance of Finland's independence, which is being carried out jointly by industry, researchers, and environmental protection officials.

During the 1970's the people of Finland truly awakened to the need for environmental protection. Ample amounts of money were used, particularly in the protecting of water resources, and the results were quite remarkable owing to the decreased amounts of effluents.

It then became clear that the improvement of the quality, and even the preservation, of the environment would continue to demand considerable financial resources.

However, Finnish society contains many other things that must be improved and environmental protection must therefore compete for marginal resources. The question then is whether a proper relationship exists between the benefits derived and the expenditures necessary.

Environmental protection is considered by some people to be a moralistic issue and having a value on its own merits. However, only limited operations are possible in present circumstances under that principle and only in especially wealthy communities.

On the other hand, there are many who believe that a good environment in which to live is only a single worthwhile objective among many others. For instance, the assuring of an adequate diet for even the most destitute, the

improvement of the general level of housing, the improvement of health care, and the raising of the quality and amount of education are objectives that must compete for their share of the financial resources. This type of thinking becomes most evident when there is a shortage of everything.

For instance, the representative from Kenya forcefully expressed the importance of the proper allocation of financial resources in his society at the meeting of experts concerned with the cost vs benefit aspects of environmental protection that was organized by UNEP (United Nations Environment Program) during autumn 1979. He also stressed the fact that improperly established environmental protection requirements must not be allowed to become an obstacle to industrialization in Kenya.

In the United States, for instance, a plan was adopted during 1978 under which the Environmental Protection Agency always prepares an economic analysis to accompany the large-scale measures that it proposes. Large-scale measures are considered to be those that may result in expenditures of more than \$100 million a year, or that may increase the price of a product by more than 5 percent, or that may increase energy use in excess of 25,000 barrels a day when expressed in terms of oil, or that may affect the supply or demand of a raw material that is in limited supply by more than 3 percent.

#### Cost and Benefit

The factor that governs the method of analysis in an environmental measure appears to be the estimate of cost vs. benefit. The factors that limit its importance, use, and basic information concerning it are most easily treated by means of examples.

Taulukko 1. (1)	
HYÖDYT (2)	(8) KUSTANNUKSIA AIHEUTTAVAT TOIMENpiteet
(1) Sairastavuuden vähentäminen.	(9) Puhdistustarpeiden hankinta ja käyttö.
(4) Metsänkasvun lisääntyminen.	Valmistustapojen muuttaminen vähemmän ilmeen joutuvia alueita aiheuttaviksi. (10)
(5) Korroosion vähentäminen.	Toimiden suljettaminen. (11)
(6) Puhdistustarpeen vähentäminen.	Ilman laadun ja päästöjen valvonta (11a)
(7) Ilman laadun parantamisen aiheuttavat hyödyt ja kustannukset.	

Key:

1. Table 1
2. BENEFITS
3. Decrease in incidents of illness

Key (Continued)

4. Improvement in forest growth
5. Decrease in amount of corrosion
6. Decreased need for purification
7. Benefits and Costs Arising from Air Quality Improvement
8. MEASURES THAT AFFECT COSTS
  9. Procurement and operation of purification equipment
  10. Conversion of manufacturing procedures toward decreased production of air pollutants
  11. The closing of factories
  - 11a. Monitoring of emissions and of air quality

Benefits derived from air pollution protection are shown in Table 1. They include improved state of health of the population, effects on the home and on industry, and decreased damage to flora and fauna.

The costs are influenced by such factors as the construction of air purification facilities and the conversion of manufacturing processes to types in which air pollutant emissions are decreased.

The costs can generally be computed quite readily and with great accuracy. But the estimating of the benefits is difficult in that the results often can be detected only partially and also in that it is difficult to place a direct monetary evaluation on them. Arguments will surely arise concerning the monetary value of an improved state of health of people or about the value of a pleasant environment.

In order to arrive at an estimate of the benefits of environmental protection it is generally necessary to first make the following determinations:

- (1) The points of emission and their effect on the quantities of the environmentally harmful substances;
- (2) The qualitative effects on the environment brought about by the decreased emissions. For instance, the effect of the air pollutants on health and on the rate of forest growth must be explained.
- (3) The extent of the pollution that is causing specifically determinable damage in the environment;
- (4) The extent of the benefits accruing from the decreased amount of damage are estimated on the basis of a common unit of measure, in this case, in terms of money.

A Difficult Estimation

Quite obviously the final phase (4) of the estimate is the most difficult, though usually not impossible. For instance, it may seem inhuman to

evaluate the increase in the incidence of illness in terms of money. However, such computations are commonplace in the planning of social welfare policies where they are based on knowledge gained through experience as to the cost of hospital care and loss of income.

Losses arising from corrosive damage caused by air pollutants can readily be determined in monetary terms. The decreased rate of forest growth arising from the sulfur content of the atmosphere is also readily convertible into monetary terms when the change in the growth rate is known.

In estimating the changes occurring in the environment it is frequently necessary to make comparisons with "clean" areas. In such cases areas that still remain in a natural state as well as residential areas in which the damage under study does not occur can be used for purposes of comparison.

Financial reports also are necessary in order to permit selection of procedures that are the most advantageous out of several that may be available. In such cases cost vs effect analyses may be used. They permit selection of the least costly procedures for the attainment of a specific objective. The objective is generally specified as a level of pollutant emission.

The outright costs must not be overlooked when seeking specific emission amounts of various pollutants or certain environmental quality levels. Needed also in the making of decisions are the customary computations concerning financing, operational costs, and the like. Generally, the fact that when something is done a cost vs benefit analysis report of the finances is given must be held to be basic.

Reports concerning costs and the benefits to be gained can be prepared about objectives of various extent. These may include the environs of an individual factory or some other objectionable source, broader areas such as a province or the entire country. However, information concerning broader areas is usually available from smaller component areas.

For instance, UNEP has devoted special attention to the importance of seeking such source information. The damage localities in Finland fortunately occur in fairly restricted areas and therefore are quite readily determinable.

There is no need here to delve further into the myriad of other factors that require analysis.

The report of the Air Quality Work Group published in 1978 notes the importance of analyzing the growth losses in coniferous forests due to the present sulfur dioxide level in the atmosphere as compared to the losses under the levels to be established as the goals for the future, in the same way

as the effects in dense forest stands under varying degrees of air pollution should be analyzed. In the investigation of damage to health, national health statistics ought to be developed to a greater degree than heretofore, and better use should be made of those already existing.

A notable group of objectives in the protection of water purity lies, for example, in the investigation of the relationship between water quality and water suitability for use.

#### The Conveying of Information

The evaluating of the quality and quantity of the benefits derived from environmental protection, and the publicizing of them at least to some extent, is difficult. The only way that the situation can be improved is by increasing the amount of research and through increased transfer of information.

There are matters on which information is available on the basis of studies conducted only in Finland, while considerable information exists elsewhere that could be helpful in the resolving of problems in Finland as well.

The applicable methods of making economic comparisons require further development. Quite obviously methods such as these for the treating of the matter are only tools for converting the information already available into a more suitable form. The possibility of their usefulness depends on whether the necessary basic information is available.

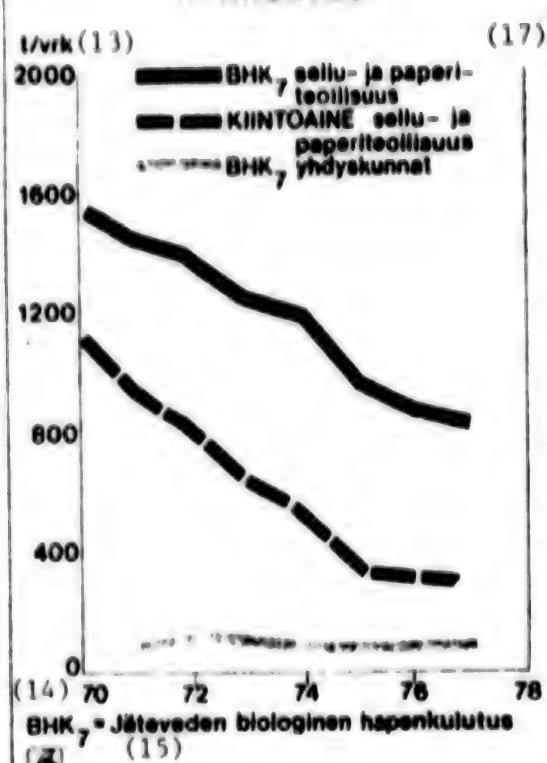
The use of deficient information may, in this matter as well, lead to faulty recommendations. On the other hand, it must be remembered that economic analyses alone do not justify the mechanical making of decisions.

Environmental protection has attained public approval. It can be said that we are all protectors of the environment. However, the need, type, and extent are matters that still require added discussion. In certain respects environmental protection is an activity that often requires extensive financial input which then deprive funding of other responsibilities that also claim public approval.

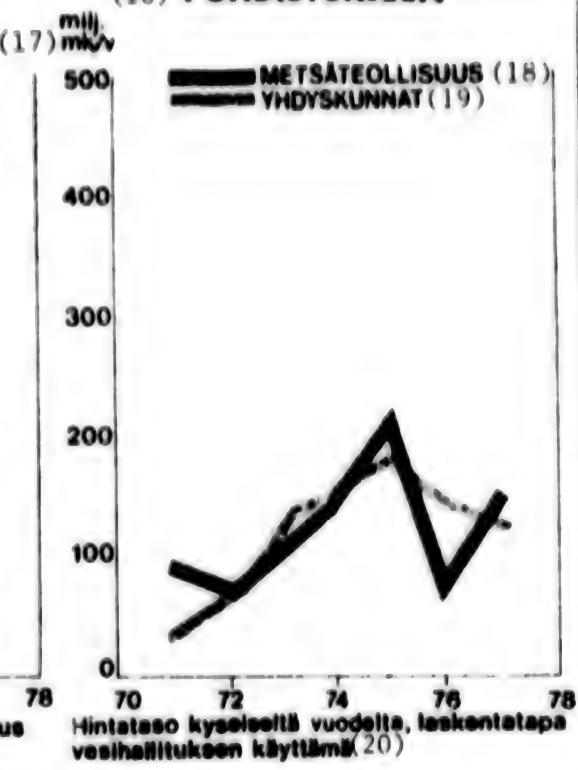
Present-day knowledge of the damage caused by changes in the environment is quite inadequate. There are some matters that obviously demand extensive measures without further justification. But certainly situations also exist in which action "just in case" is not justified in the face of marginal funding. It appears that the determining of effects and damages is an area that requires intensive investigation.

The methods used in economic analyses provide a tool that can be used also in the effort to guide environmental protection in the proper direction toward a healthy and lasting basis.

KUVA JÄTEVESIKUORMITUKSEN  
(12) MUUTOS



INVESTITOINNIT JÄTEVEDEN-  
(16) PUHDISTUKSEEN



Key:

12. Figure 1. Change in the Pollutant Loading of Waste Water
13. Tons per 24 hours
- 13a. BHK<sub>7</sub> of the cellulose and paper industry
- 13b. solids in the cellulose and paper industry waste water
- 13c. BHK<sub>7</sub> of community waste water
14. Year
15. BHK<sub>7</sub> - Biological oxygen consumption of waste water
16. Investments for Waste Water Purification
17. Millions of markkas per annum
18. Forest industry
19. Communities
20. Price Index in the Year Involved; the method of computation is that used by the Waterways Administration

5955

CSO: 5000

BOOM IN FOREST INDUSTRY HURTS WATERS' QUALITY

Helsinki HELSINGIN SANOMAT in Finnish 12 Apr 80 p 8

[Article: "Forest Industry Boom Reveals Loophole in Water Purity Protection; Permits Granted by Water Rights Courts Hasten Water Pollution"]

[Text] The condition of the waters in Finland has deteriorated materially during the past 2 years. It is caused by the boom in the forest industry.

The permits currently in effect that were granted by the water rights courts permit the release of wastes in amounts that accelerate the pollution of the waters.

The polluted area in the south part of Lake Saimaa has spread into a broader area since spring 1979, which followed one of the worst winters of the 1970's in the Saimaa waters. During the winter bottom currents carried waste water a distance of 40 kilometers from the Kaukaa factories to the Ilkonselka and Mantyselka expanses of central Lake Saimaa.

These two expanses have been notable as spawning beds for the small white-fish species of the area and as excellent seining waters.

As recently as 2 years ago the belief in the Lake Saimaa area was that control had been gained over the pollution, but during winter 1978-1979 fishermen reported finding some foul-smelling and unpleasant-tasting fish in their catch. The same has been reported during winter 1979-1980.

The Kymi water district has provided support to the monitoring of water quality in the Saimaa waters. Water samples have been collected from over 60 testing points twice a week.

The extent of the polluted area is difficult to determine, but it is estimated that an area of more than 100 square kilometers of Lake Saimaa is polluted by waste water.

Wood processing factories are almost entirely responsible for the pollution in the south part of Lake Saimaa. The factories are not releasing pollutants in amounts greater than the water rights court has specified. Nonetheless, the amount of pollution is increasing.

#### Sea Malodorous at Kotka

The offshore area in the sea at Kotka has also suffered from the economic boom. The polluted area has spread during the 1978-1979 and 1979-1980 winters. The waste water currents under the ice have spread odorous water of low oxygen content for a distance of about 10 kilometers eastward of Kotka, in the direction of Hamina.

The wastes that come down the Kymijoki river formerly spread westward from Kotka, but because of dredging and other operations they are now diverted eastward of Kotka to the annoyance of residents there. Also suffering from the wastes are the sea trout that have been planted in the area.

The factories along the banks of the Kymijoki have not always without evasion observed the conditions set by the water rights court permits, but have on occasion released excessive amounts of waste water, according to division chief Kimmo Karimo of the Waterways Administration.

The following enterprises have permits from the water rights court to release wastes into the Kymijoki: the Enso-Gutzeit insulite and Kotka factories, Kymi Kymmene, Myllykoski Oy, A. Ahlstrom Oy, Sunila Oy, Stockfors Oy, Tampella Oy, Valmet Oy, and Yhtyneet Paperitehtaat Oy.

The water quality test reports for winter 1979-1980 in the Pohjois-Karjala province have not yet been compiled. However, that water district has received complaints about mucilaginous accumulations in fishnets in the Pielisjoki river below the Uimaharju wood processing plants.

#### Whitefish and Salmon Missing at Pietarsaari Sea Front

Conditions at the Pietarsaari sea front during the winters of 1978-1979 and 1979-1980 were not without exception in the matter of increasing pollution, except that it has increased uniformly throughout the decade of the 1970's.

The professional fishermen have complained that the polluted waters have spread also during winter 1979-1980 into the Kokkola water district. The dark, murky waters low in oxygen are driving the whitefish and salmon, and therefore the fishermen further out to sea each year.

The Schauman wood processing plant releases waste water at the Pietarsaari sea front in accordance with the permits granted by the water rights court. In fact, the plant effluents have in certain respects been reduced to less

than one half of the former amounts, but nonetheless, the polluted area in the Pietarsaari sea front has increased in size by more than 1,000 hectares during the 1970's.

The Schauman plant will need to apply for a new waste water discharge permit before the end of 1981. The situation review, which is due to begin in April 1980, is expected to be an exceptionally rousing one because the residents of the area have already prepared a petition with 6,000 signatures demanding better purification of the plant waste water.

#### **Pollution Increases Also in Central Finland**

Increased pollution of lakes has been noted also in central Finland in recent years as a result of waste water from the forest industry. However, the discharge of waste water has been within the limits set by the water rights court.

Final results are not yet available of the tests concerning the quality of the water during winter 1979-1980 in Lake Päijanne, but the samples thus far analyzed show that the quality of the water has deteriorated. The polluted area has not increased materially in size, but the degree of pollution has intensified in the areas into which the wood processing industry discharges waste water.

The condition of the water in Lake Lievestuore also has deteriorated.

The intensity of pollution in Lake Kallavesi also has increased as a result of the Savo cellulose plant operations, but the extent of the polluted area remains largely as it was during 1979.

The concern about industrial water pollution among Kallavesi water drinkers in Kuopio was resolved a few days ago. A new intake pipe for city water has been installed about 7 meters below the surface of the lake. During winter, when the waste water gravitates to the bottom, the new intake pipe will draw drinking water from near the surface.

#### **Exceptions That Have Been Noted**

The Lappi water district reports that the water in Kentjarvi has fared fairly well in respect to pollution loading. That is because of the river-like nature of that lake, which causes a rapid rate of water exchange with minimal residual wastes.

The extent of the polluted area in the waters of Oulujarvi has also remained unchanged despite the increased demand for wood cellulose. In this lake also the situation is eased by the rapid exchange of water.

The abundant precipitation during winter 1979-1980 eased the pollution situation in the Kemiänenjoki river water system during the upsurge in the wood processing industry. There also the water was of lower quality during winter 1978-1979 than it was in the mid 1970's. The amount of pollution loading has increased. A few of the factories that discharge wastes into the Kemiänenjoki have not observed the conditions specified by the water rights court. Nothing alarming has been noted on the sea front at Oulu. However, the Oulu water district has not yet analyzed the samples taken during winter 1979-1980.

#### **Waterways Administration To Update Permit Requirements**

The Waterways Administration is not satisfied with the water anti-pollution measures of the wood processing industry in recent years. Also, some of the old waste water discharge permits are too lax, according to Kimmo Karimo.

Many wood processing plants will need to renew their waste water discharge permits in coming years. In that process the Waterways Administration will attempt to reduce the amount of waste discharge by the plants.

Another natural phase during which this could be accomplished is when a factory is converting to the pressure pulping or the heat grinding process. Several of such conversions are underway in Finland.

If it should not be possible to enhance the water pollution protection during the renewal of permits, then the Waterways Administration could apply for short-term emergency permits or more stringent permits from the water rights court for the pollution-causing plants even though their original permits are still in force.

Should wastes be discharged in amounts greater than specified in the permits, then the Waterways Administration can request official assistance in curbing the violators.

#### **Forest Industry Desire To Practice Protection Dampens**

The desire of the forest industry to make investments for the promoting of water quality protection has diminished in recent years.

According to a Waterways Administration report the wood processing industry invested over 238 million markkas for water quality protection in 1975, but only a scant 59 million in 1978. Engineer Seppo Ruonala of the Waterways Administration feels that the 1979 investment was even less than the 1978 figure.

Thus far the present boom in the forest industry is evident only in steadily increasing water pollution, unlike that of the early 1970's which was characterized by increasing investment for water quality protection.

During the period 1972-1976 the water quality protection investments of the forest industry produced an average return of 1.7 million markkas in excess of operating costs. These investments by the cellulose and the paper industries have therefore been profitable.

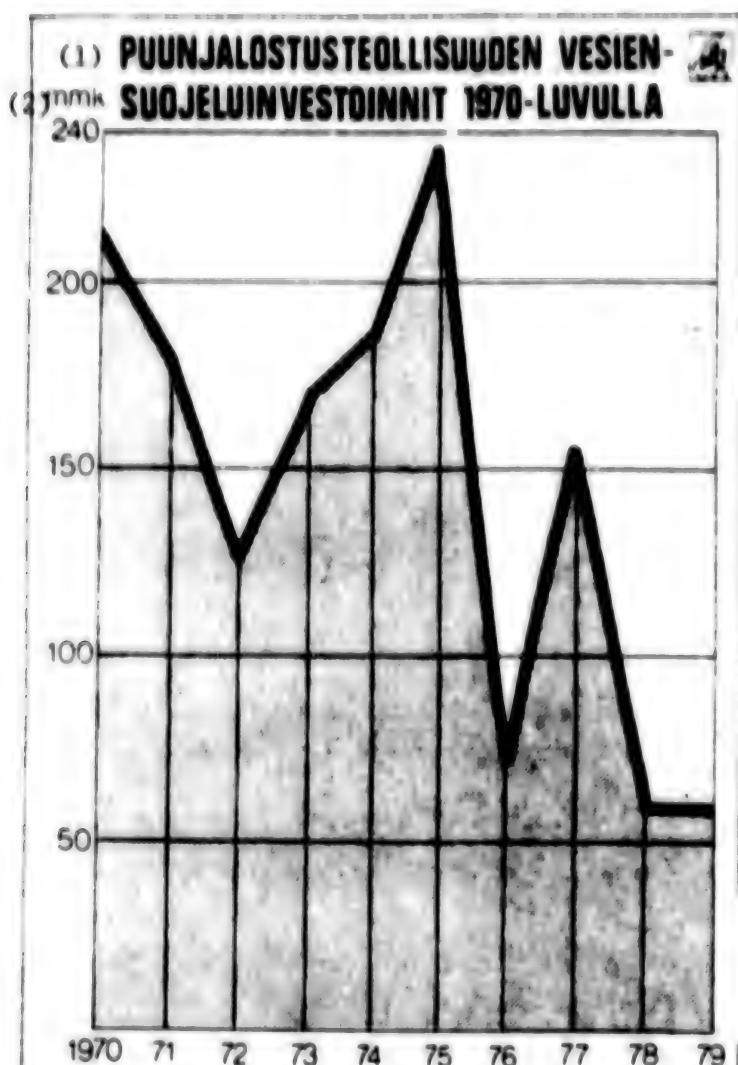
The reason for the declining interest in water quality protection is that new investments for that purpose are less rewarding for industry.

From the standpoint of the national economy, the water quality protection program has not been merely an expense. It has provided steady employment each year for 1,200 individuals and temporary employment for 3,400 in the forest industry.

Even at its highest during the past decade, the share of investments by the forest industry in tasks aiming at water quality protection was under 10 percent of its annual investments. By 1978 the amount of investment by the forest industry in water quality protection had fallen to 4.5 percent of the total.

During the period 1972-1976 the investments of the forest industry in water quality protection in Finland amounted to .08 percent of the gross national product.

During the same period the expenditures for water quality protection amounted to 0.4 percent of the volume of business conducted by the cellulose and paper industries.



(3) Vuoden 1979 vesisuojeluinvestointien määrä on vasta arvio.

**Key:**

1. Water Quality Protection Investments of the Wood Processing Industry During the 1970's
2. Millions of Markkas
3. The figure for 1979 is an estimate.

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## POLLUTION OF GULF OF SALERNO REPORTED

Naples IL MATTINO in Italian 17 Sep 80 p 1

[Article by Nicola Fruscione: "The Gulf of Salerno Polluted. Five Rivers Are To Blame"]

[Text] Salerno--"Despite what is said by the government, the Irno does not merit the label of river. It should be called a 'Cloaca Maxima' of the water system around the city. It is one of the major causes for the high amounts of pollutants in the sea." The above words, which were part of a report for Salerno's Court of Appeals Proxy, encapsulate the current hygiene situation there. Not one step has been taken toward removing the decree banning swimming issued 2 years ago by a mayor who made no bones about the situation.

This is a bitter and dramatic conclusion which comes late in the game affecting a season which attempted to look beyond the fact that between Battipaglia and Vietri sul Mare and even beyond the waters were polluted.

The research project covering the sea of Salerno was awarded some months ago to five technicians of proven reliability: Professors Biagio Lo Scalzo and Vincenzo Dovinola, Dr Roberto Blundo, Raffaele Di Florio and Dr Vincenza De Martino.

Now, the report which contains the technical data lays blame on the five rivers which make up the city's hydrological basin and whose names are Bonea, Irno, Tusciano, Picentino and Fuorni. It is via these waterways, some of them originating from incredibly clear springs, that considerable amounts of bacteria reach the sea. It is easy to explain why: the Merli law dealing with discharge pollution levels has been totally ignored. Cases of the law being enforced are extremely rare. Sewers which service large urban zones were linked to rivers without any precautions taken whatsoever, and the refuse is thus discharged in the sea.

The Council of Appeals Proxy is now moving to indict the guilty. There are blatant violations of decrees (dealing with the penal code as well as with norms of the "Merli" law) that call for the issuing of a whole series

of judicial indictments. Presumably these have already been issued by the Bench. Some of the Indictments may even be issued to analysis experts. It has been suggested by some that a number of them may have been particularly accomodating. Perhaps it may just be an isolated case, but the report makes mention of enormous divergencies between some of the results contained in the report and those reached by the judicial investigators. The differences may be due to "differing methodologies," state the experts. This may be viewed as a cautious method of leaving the search for truth up to the judge.

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EXPERT SAYS OVERCLEANING OF WASTE WATER ADDS CHEMICALS

Stockholm DAGENS NYHETER in Swedish 19 Sep 80 p 28

[Article by Kjell Löfberg, of the DAGENS NYHETER Örebro office]

[Text] Örebro, Thursday [25 Sep]--"If we purify the municipal sewage less it will delay the acidification of many lakes in what are called 'low-nutritent' areas. Today we are 'purifying' ourselves to death," says Torbjörn Sjöström, fishery consultant in the Örebro district fisheries board.

"In the future we shall have to be more flexible with regard to municipal sewage treatment. Industrial wastes, on the other hand, will of course be purified completely."

In an acid lake the water is quite clear and there is little vegetation. The pH value is less than 7. When it gets below 5 many species of fish die. Pike and perch survive longest.

In acid watercourses the mercury content in fish often rises. Watercourses with fish that contain 1 mg of mercury per kg of flesh are blacklisted.

**Liming Does Not Suffice**

"Simply liming the lake does not suffice to counteract acidification. I believe lime together with fertilizing may be a feasible method. But there is no evidence for that today. In Örebro we have gotten state and municipal money for an experiment in fertilizing a lake. The experiment will be a group from, among other institutions, the environmental board and the fishery authorities," says Torbjörn Sjöström.

"There are thousands of lakes that should be blacklisted, but no samples have been taken from them because the health boards and the food authorities have not got adequate resources. The more lakes we take samples from, the more are blacklisted. That is the bitter truth."

The waters that are worst off are lakes in moraine and mountain terrain - lakes that are poor in nutrients and lime.

#### Mercury From Above

"Spring lakes of the type that is found in the mining district should not be blacklisted, since no industrial wastes are found there. The black-listing of these waters is due chiefly to airborne mercury from industrial wastes."

"The microscopically small particles are carried along with the wind and later fall. It does not take many grams of mercury for a lake to become acid."

In an acid lake all the dead plankton settles to the bottom, taking with it the mercury in one sediment after another. By liming the acidification can be overcome and the plankton renewed, but it is not certain that the mercury will disappear.

"When we fertilize the water we add phosphorus and nitrogen to make the water richer in nutrients. Exactly the opposite of what sewage purification does. But there must not be too much nourishment. Then we could grow algae, and we do not want to do that."

For 5 years the fisheries board in Örebro will test this method. In November 350 tons of lime will be spread in the Ram lake, which is in Kilsbergen, and beginning in May 1981 a few kilograms of fertilizer will be added to the lake continuously throughout the natural growing season.

The idea is that the more plankton organisms form in the sea the more nutrients are spread on top of the mercury. Plankton is the fishes' food to a great extent. This will result in a larger number of fish in the lake and a lower mercury content in each fish.

"The plankton organisms increase with fertilizing. That is why I think we perhaps should think twice about purification of the municipal waste water," says Torbjörn Sjöström.

"But that applies only to nutrient-poor areas."

"In nutrient-rich watercourses, i.e. lakes that are growing again, the problem is reversed. There the sewage must be fully treated. We find those areas as a rule in big mining districts."

"Today there are no signboards to indicate it if a lake is blacklisted. If there were, wild areas would probably be full of signboards," Torbjörn Sjöström explains. Instead, information about blacklisted watercourses is furnished by the various fish protection organizations at the time of purchase of a fishing license, etc.

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AUTHORITIES WEIGH PROBLEM OF TOXIC WASTE DISPOSAL.

Stockholm DAGENS NYHETER in Swedish 19 Sep 80 p 28

[Reportage by Bo G. Andersson, Hans Kronfors, and Ola Säll]

[Text] Sweden's chronic poisons crisis of many years' standing became acute Thursday [18 September] when the län (district) administration in Stockholm said no to continued burning at Lövsta, just outside of Stockholm. The confusion is total. In the backyards of the plants the mountain of poisons dangerous to the environment is growing.

The state concern SAKAB [Svensk Avfallskonvertering AB; Swedish Waste Conversion, Inc.], which operates Lövsta, is now looking feverishly for temporary storage places. Among other things they are looking for empty oil drums along the coast so as to be prepared if Lövsta is shut down at the end of the year.

There is hope of a big new burning installation in Kramfors. But that hope hangs by a fragile thread. Even if the installation is approved it will take at least 2 years before it can be put into operation.

In Lövsta, just outside Stockholm 5,000-6,000 tons of solid waste dangerous to the environment is burned each year. In addition, large amounts are stored awaiting transport out of the country.

The län administration says no both to continued burning and to storage of waste to be exported.

The burning goes on daily. The installation is rundown and poorly maintained. The result is that big doses of heavy metals get out into the air and water.

The installation is also poorly located, too close to Lake Mälaren, and has deficient highway connections.

That is how the Mön administration justifies its decision.

If the Mön administration gets support for its position from the concession board for environmental protection, the operation at Lövsta will be stopped at the end of the year.

The Stockholm, Järfälla, and Ekerö municipal governments said no earlier. The environmental protection agency will soon give its recommendation to the concession board.

#### 'Plants Will Have To Manage for Themselves'

"The plants that now haul the waste to Lövsta will have to count on taking it in hand themselves if Lövsta is shut down. We have no way of handling it otherwise," says Lars Ljung, SAKAB's technical chief.

"At best we may solve the problem temporarily by looking up temporary storage places, old oil tanks, for example. But we do not know whether we will succeed in finding suitable places."

Eskilstuna and Lomma are two municipalities that are being considered for temporary storage stations if Lövsta is shut down.

Within the industry there are very small facilities for storing the waste that SAKAB is storing and burning today.

"This increases the risk that the waste will 'disappear' in illegal ways," Lars Ljung says.

"In the few cases where industries can still store the waste, other problems will arise. Today there is no proper packing that will do for long-term storage."

#### SAKAB Inadequate

Very recently SAKAB has found that there is a growing need within industry to get rid of waste that is dangerous to the environment. An ever greater part of the requests that SAKAB gets cannot be handled.

SAKAB considers the chances of exporting additional amounts of waste practically nonexistent.

"Most of the installations in Europe have all they can do. Also, it is hard to export because a country can stop the import for environmental reasons at any time," says Lars Ljung.

### Opinion Permits Nothing

"If we went by the local opinions against SAKAB, no industry at all could be permitted. There are too many in this debate that do not know what it is about."

That salvo comes from Arne Kardell, the ministry of agriculture representative on the SAKAB board.

"It appears that we are too elegant in this country to take care of our own wastes," he says.

The municipal government of Stockholm has said no to SAKAB's installation in LÖvsta, which will be closed at the end of the year.

"It is double-moral to benefit from industry and not see to it that the wastes are taken care of. Instead, they are sitting with their arms folded. A minimum demand is an installation for storing the waste at least. Not even that is being provided."

### Municipalities Bewildered

In Sweden's 278 municipalities the bewilderment will increase still further if LÖvsta disappears. From this year on, the municipalities will bear the responsibility for collecting and transporting wastes that are dangerous to the environment.

"But the municipalities have been worried and uncertain since SAKAB's resources have been so limited. Now they are being still further reduced," says Anders Höjlund, the environment protection agency's expert on wastes dangerous to the environment."

Hitherto there have been only some 30 municipalities that assumed that responsibility, mostly the larger municipalities.

"It has become a vicious circle which can be broken only if a central burning installation is built," he says.

In expectation of that, a "war group" has been formed of people from the Swedish Federation of Industries, the Federation of Municipalities, and the environmental protection agency. It is trying to find short-term solutions of the waste problem.

"We are trying to find short-term solutions to take care of the acute situation. E.g., the Swedish Federation of Industries is investigating whether certain firms can burn organic waste in furnaces that are normally used for production," says Anders Höjlund says.

But the problem is that in that case there would be a risk of cutting the ground from under the feet of a future burning installation under SAKAB's

management. For such an installation to be efficient it must operate 24 hours a day. That calls for all waste's being taken care of by SAKAB.

#### 'If Lövsta Is Shut Down There Will Be Panic'

"If Lövsta is shut down the situation will be panicky. Where shall we send our paint wastes then?" Aira Törmänen, of Becker's Paint Industry in Stockholm, wonders.

Becker's factory in Liljeholmen is one of the industries that regularly send waste to Lövsta, just outside Stockholm, for destruction. A shipment goes twice a year, with a total of 70-odd tons of solid paint wastes. Part of the waste is stored at Lövsta awaiting export out of Sweden.

"We have no space to store our waste on our plant premises," says Aira Törmänen.

Many other firms share the uneasiness and bafflement that Becker's has.

"It is a pity that those who are protesting against a central waste installation do not understand that they can only make the pollution of the environment worse that way. After all, the waste has to be dealt with some way," says Aira Törmänen, foreman at Becker's with responsibility for the firm's toxic wastes.

#### Nobody Knows How Much Dangerous Waste There Is

Exactly how much waste there is that is dangerous to the environment is hard to estimate. A questionnaire sent out by the environmental protection agency in 1977 was a big fiasco. Of 70,000 firms, only half answered.

Every year, according to the environmental protection agency's estimates, about half a million tons of waste dangerous to the environment "accrues" in Sweden. Industry itself manages to clean up or destroy a large part of this. About 20,000 tons is exported abroad.

In a survey done by the environmental protection agency in 1977 in which industry furnished information about its waste, it was found that the firms did not know what to do with 12,000 tons of waste. That figure has quite certainly increased considerably since then.

#### Four Kinds of Waste Export

The waste exported may be divided into four types.

1. Liquid waste of high chlorine content. Burned on special vessels in the North Sea. Sweden exports about 4,000 tons a year.

2. Solid waste of the type of cyanides, cadmium, and PCB [polychlorobiphenyl]. About 2,000 to 3,000 tons is exported, mostly to the FRG, where it is stored in salt mines.

3. Liquid and semisolid organic waste of the type of dye and paint waste, chemical warfare agents, oil sludge. This type of waste would be dealt with in the central burning furnace that SAKAB wants to have in Kramfors or Norrtorp. It is now exported to England and the FRG.

4. Mercury batteries, catalytic compounds. Often products that go back to the producer for reuse.

Most of the waste dangerous to the environment comes from oil, 200,000 tons a year. The firms themselves take care of half of this. A large part of the rest is purified and used for other purposes, such as fertilizer, or is bought by other industries where it can be used as fuel.

#### Certainly SAKAB Is Needed, but Nobody Wants It

Svensk Avfallsområdering AB, SAKAB, was formed in July 1969. Its mission was to be to take care of industrial waste that are dangerous to the environment.

A good 11 years later the problem of toxic waste is still unsolved.

SAKAB--which is 85 percent state-owned--has gone to several mines. Stora Vika, Falkenberg, Norrtorp--to name a few places--are examples of far advanced projects that have been shut down because of environmentalist opinion and various authorities. In the case of Norrtopp, however, SAKAB has not lost all hope.

But most of all SAKAB is staking its hopes on the municipality of Kramfors. Regardless of what is finally done with the Lövsta installation just outside of Stockholm, SAKAB must have a big new central installation.

Here is SAKAB's statement to all opponents:

When a new project is first presented to a municipality the reaction is positive, because it involves new jobs. But later, when the mass media have described the plans, opposition groups are formed that begin to agitate against the project.

Then the municipality begins to back out. Gradually it says no. SAKAB must then withdraw and turns out to be the loser.

In recent years the corporation has done poorly; in 1978-1979 there was a record loss of 2.3 million kronor. For that reason it was necessary to raise the price of services, and as a result fewer had recourse to the corporation.

There has been a great deal of criticism of SAKAB through the years. Last year Sven-Tore Holm, the environmental protection director in Malmöhus Län, said in an interview:

"We do not know whether we can recommend to industry that it turn to SAKAB. Sometimes it refuses to accept the waste, and it has happened that it returned waste to the industry."

#### 'We Do Not Want to Turn Kramfors Into a Trash Pile'

"We do not want Kramfors to become the trash pile of all Sweden. It is madness to transport dangerous substances up here by road," say the opponents of SAKAB.

One fourth of the population of Kramfors have signed protests against SAKAB. But most of the municipal politicians take a positive view.

"We need the jobs," says Councilman Kurt Jansson (S [Social Democrat]). "Besides, the emission will be minimal."

SAKAB has applied to the concession board for environmental protection for permission to build a burning installation for industrial waste at Sandviken, 2 kilometers north of the center of Kramfors, adjacent to the site of a closed SCA [Swedish Cellulose Inc] plant.

The Kramfors municipal government has not yet decided what stand to take, but has asked for supplementary information from SAKAB, the environmental protection agency, and the län administration in Västernorrland.

#### Social Democrats Favorable

Today the Social Democrats, who are also in power in the municipal government, are largely favorable, as is the Center Party.

The Conservatives and the Liberals are not very numerous in Kramars and so far have made no negative statement against the location of SAKAB there. The only ones who have openly objected are the VPK [Left Party Communists].

"The municipal government still has a month or so to think it over before taking a stand. A decision is not expected from the concession board before the middle of October on whether it will give SAKAB the green light or not."

Today Kramfors is engulfed in the environmental fight. The municipal administration is confronting the local environmental group and a number of families with children who have enlisted themselves against SAKAB.

#### 'Low Blows and Shabby Arguments'

Both sides accuse each other of low blows and shabby arguments. Councilman Kurt Jansson accuses the opponents of using the mass media as a club, while the environmentalists say the same of the municipal government.

Recently the group turned in a list with 6,000 signatures to the municipal government.

"Inasmuch as 90 percent of the waste for SAKAB will be transported here from the south along E4, it will be expensive and there will be a risk of accidents," says Annelie Eriksson, one of the opponents.

SAKAB is counting on an annual emission of 20 tons of sulfur dioxide, 2 tons of hydrochloric acid gas, and 36 tons of dust and heavy metals.

The shut-down Sandviken plant which was located where SAKAB is planning to build emitted 600 tons of sulfur dioxide annually. The Vilja plant to the north of Kramfors emits 1,500 tons a year.

"Since the wind is usually from the north, SAKAB's emissions into the air will drift straight into town. Besides, there is a risk of landslides in the area. Not more than a year ago a lot of ground slid down into the Angerman River," says Annelie Eriksson.

#### 'What If the Purification Breaks Down?'

"Of course SAKAB and the municipal government say that very little emission will be involved, but what happens if there is an accidental breakdown in the purification installation? There are examples in other countries that indicate that very small operating breakdowns lead to big emissions."

Councilman Kurt Jansson accuses the opponents of emotional arguments.

"They are exhibiting an outrageous double standard.

"It should be in the interests of environmental protection for the dangerous oils and paints to be treated and not buried or left lying on the ground or in trash piles.

"To us it is a question of employment, of course. We have about 500 unemployed persons in the municipality, and many of them could get jobs at SAKAB.

#### Further Studies

"But of course we do not want to have an environmentally dangerous industry here. For that reason we have asked for further studies of what effects SAKAB's location here would have on the air. We are aware that there can be trouble because Kramfors is situated in a valley," says Kurt Jansson.

SAKAB is expected to offer about 50 jobs. For the last 40 years the Å valley has experienced a serious reduction in the number of industries. Today all that is left of the wood industries is a cellulose factory, NCB [Norrland's Forestry Owners Association], and three fairly large sawmills.

If SAKAB gets permission to build in Kramfors it will take 2 to 3 years before the installation is completed.

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D.S.